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They aren't all this adventurous, but it helps. **Follows page 52.**

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Payoffs, pitfalls of centralized access. **Intranets follows page 32.**

COMPUTERWORLD

The Newsweekly for Information Technology Leaders
News updates, features, forums: www.computerworld.com
May 25, 1998 • Vol. 32 • No. 21 • 112 pages • $4/Copy

"Microsoft needs to understand the impact it has on everyone and needs some [governance] on what it's doing. If it's unwilling to control itself, then it needs someone to impose discipline."

— Roger Walters,
CIO, Booz Allen & Hamilton, McLean, Va.

"We're pleased the Justice Department recognizes that the previous settlement remedies [in July 1994] weren't enough because Microsoft didn't change its business practices."

— Ken Wasch,
President, Software Publishers Association, Washington

"What worries me is that if we create and innovate and discover something new, are we going to be able to let our customers have it? You'd think that would be a slam-dunk easy question, but that's not the world we live in."

— Nathan Myhrvold,
Chief technology officer, Microsoft Corp

U.S. Attorney General Janet Reno called the Justice Department's antitrust lawsuit against Microsoft "a step to keep our marketplace competitive." (See stories pages 98 and 99.)

Feds lower the boom

Users: Windows vital, but regulation isn't

By Kim S. Nash and Sharon Gaudin

HAS MICROSOFT CORP.'s Windows operating system become so pervasive and crucial to the day-to-day operations of corporations that it has become an "essential facility"?

That issue was hotly debated last week after two antitrust lawsuits were filed against Microsoft. The suits appeared to go beyond monopoly issues by

Windows, page 99

Compared with a year ago, do you hold Microsoft in higher, lower or the same esteem?

Base: 102 IS managers at companies with more than 250 employees

Source: Computerworld Information Management Group, Framingham, Mass.

Customers endorse Wintel status quo

By Sharon Gaudin and Kim Girard

WITH WINTEL in the legal hot seat, users say they want the government to leave their desktops alone.

The so-called "Wintel" duopoly, Microsoft Corp. and Intel Corp., has forged what many consider to be the most successful partnership in the industry, coupling up on nearly 90% of the desktops in corporate Amer-

Customers endorse, page 98

DEEP IMPACT

If the lawsuits against Microsoft continue for several years, users said they expect the following to happen:

At their company	In the industry	At Microsoft
▶ It will be harder to plan ahead	▶ Product choice will be expanded	▶ It will enter into alliances
▶ IT costs will be raised	▶ There will be more innovation	▶ It will enter new markets
▶ Migration to Windows NT will be more likely	▶ Prices will be higher	▶ It will delay introduction of new products
		▶ It will divert resources from product development

Base: 102 IS managers at companies with more than 250 employees

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Banks need to keep francs, marks on the books until 2002. Page 6

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UP FRONT

Justice scores

Joel Klein, I take it all back. I haven't exactly been the Justice Department's biggest fan since it signed a wimpy consent decree with Bill Gates nearly four years ago. But last week's sweeping action against Microsoft was bold, forceful and effective. It may not make the gang in Redmond, Wash., any less pugnacious, but it certainly will put a crimp in their style.

Suing Microsoft took guts. It took guts to walk away from Microsoft's last-minute settlement shenanigans, and it took guts to stand up for the interests of PC makers who were too spineless to criticize Microsoft themselves.

The suit also goes to the heart of the monopoly issue: Microsoft's grand plan to control the Internet and its ongoing efforts to extend its dominance on the desktop. Let's take each in order.

The browser issue isn't about browsers at all but about who controls the window to the Internet. A browser is a simple utility, like the electrical wires on your street or the telephone line to your house. But the company that owns that utility is in a position to exert tremendous influence over how it's used.

If Microsoft gains critical mass in browsers — and it has the patience to do so — it will be in a position to tell information providers what they put on their Web sites, whose tools they use and how much they pay for the privilege of being seen on Microsoft screens. Hey, Visa. You want to use our great new security technology? Then make sure your business partners all have this $10,000 server package. And we'd like a nickel per transaction, too, if you don't mind.

No company should have that much influence over a free and open medium.

No company should have that much influence over a free and open medium. The Justice Department seems committed to making sure no company will.

The more interesting issue, though, is Justice's demand that Microsoft open up the programming interfaces for Windows. In filing its claim, Justice pointed to the need for PC makers to customize the Windows interface so their brand — not Microsoft's — is the first thing users see. PC makers are salivating over the prospect of using that leverage to reinforce their brands. They hate the idea that a lot of users think their PCs are made by Microsoft. But I think the implications of an open Windows interface are more profound.

If Dell can have a customized version of Windows, for example, then why shouldn't Bankers Trust or American Airlines have the same thing? Imagine if you could distribute a desktop operating system that was hard-wired with an interface of your own design, with all the file access, network links and program permissions built in. That's exciting, in fact, that's a whole new software industry. Its impact could be as dramatic as IBM's software unbundling 25 years ago.

All of that is pie in the sky, of course, until the case works its way through the courts. That could take years. And if IBM's experience is any indication, Microsoft should do just fine in the interim.

But antitrust suits exact a toll. They force companies to be more cautious, more reflective. If that's all the Justice Department's suit accomplishes, it will have struck a blow for competition in the software industry.

Paul Gillin, *Editor*
Internet: *paul_gillin@cw.com*

Delta reroutes disparate data

▸ *Airline consolidates networks to reduce costs, improve flight service*

By Laura DiDio and Jaikumar Vijayan

DELTA AIR LINES, playing catch-up with the rest of the airline industry, is close to completing a massive project to integrate a hodgepodge of legacy systems to improve customer service and management decisions.

When the multimillion-dollar project is completed at year's end, the integration effort is expected to give workers at 300 Delta offices and airports worldwide improved real-time access to all flight and reservations-related information within seconds.

The integration project will benefit travelers by helping managers quickly respond to problems such as flight delays and cancellations.

Powering the integration is IBM's MQSeries messaging middleware, which will replace Delta's homegrown technology. MQSeries will meld all the airline's core ticketing, flight and reservations applications.

An MQSeries-based system will let us deliver messages in minutes or hours instead of days or months
- Mark Whitney
Delta Air Lines

Real-time data collected from ticketing and reservations systems, flight dispatches, ground staff and maintenance crew is transported via MQSeries to a hub. The hub translates and reformats data from different systems into a common format understood by all systems. The data is then poured into large central databases, which feed it to different servers for use in operational or management applications.

Under the old setup, Delta managers usually had to wait 24 hours to receive critical flight information from Delta's Atlanta headquarters and airports around the globe, said Mark Whitney, Delta's director of middleware. The new system "will let us cut [application] development time by 85% and will let us deliver messages in minutes or hours, instead of days or months," he said.

Most other major airlines also are leveraging their existing databases and mainframe or client/server equipment to project travel trends, reduce operating costs and deliver better customer service.

United Airlines' yield-management systems, for instance, pull a range of operational and financial information from each of the 4,000 flights the airline operates daily and lets revenue planners optimize ticket prices.

"This project will put Delta back at the head of the class," said Mike Lunenberg, an airline analyst at Merrill Lynch Global Securities, Inc. in New York. "It will provide customers with quicker, more efficient service overall and give them better access to information ranging from the latest ticket prices to the number of frequent-flier miles they've earned."

By its own admission, Delta's application integration project was long overdue.

In a memo to employees last fall, Delta CEO Leo Mullin emphasized that the airline had to improve the integration of its core business systems, because the lack of such integration had resulted in sluggish data gathering and analysis. So last October, Delta brought in Irving, Texas, consultant Charlie Feld as chief information officer, under a rare two-year contract, to straighten out the company's information systems. □

IS set for holiday rush

Airlines last week braced for what was expected to be their busiest travel time this year, the Memorial Day weekend, but claimed their computer systems were up to the job.

With the booming economy, 12.5 million people were expected to fly over the three-day weekend, the Air Transport Association predicted last week.

But that was unlikely to slow down systems at the major airlines, because most of them had the system capacity to handle additional loads, said Dave Swierenga, chief economist at the association in Washington.

And most reservations and travel plans for the Memorial Day weekend were made weeks or months in advance. So there was little chance of a last-minute rush that would crash systems, said Barbara Boyar, president of Avmark, Inc., an aviation consulting firm in Arlington, Va.

Avis Rent A Car, Inc. expected its reservations systems to be ready for the holiday crunch, partly because it added extra capacity following a 31-hour system crash earlier this month [CW, May 18]. The system, operated by Wiscorn International Ltd. in Garden City, N.Y., serves Avis and 19 other rental car businesses and 80 hotels.

Because of the outage, Wiscorn added capacity and put in fail-safe systems to deal with an increase in reservations queries, an Avis spokeswoman said. — Jaikumar Vijayan and Matt Hamblen

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Satellite failure is a wake-up call to users

▸ *Communications snafu points to need for backup*

By Patrick Thibodeau

RICK KOELZ, like a lot of technology managers last week, was scratching his head, wondering how one satellite glitch could cause so many problems here on Earth.

Galaxy IV, a satellite that handles most of the nation's pager traffic, stopped working last Tuesday at 6 p.m. when two computers on the satellite — a primary and a backup machine — failed. The computers keep the satellite aligned with satellite dishes on the ground.

When the satellite's computers went out, so did the system Koelz uses to stay in touch with newspaper carriers at *The Tennessean*, a Nashville newspaper owned by Gannett Co.

"We had to go with cellular phones" for communications, he said.

Koelz was surprised that one satellite outage could so broadly knock out pager communications. "I think there's got to be a backup other than that existing satellite," he said.

OTHER VICTIMS

Besides cutting off service to millions of pagers, the outage caused problems for businesses that rely on the satellite links for retail transaction-processing systems.

Chevron Corp. lost its link with pay-at-the-pump systems at 5,400 gas stations. The pumps are connected to rooftop satellite dishes for credit-card authorizations. (Customers could still pay via credit card with a station attendant.)

Restoring pump service meant pointing the satellite dishes toward a backup satellite. The San Francisco-based company late last week was bringing stations back online at the rate of one per minute, said Fred Gorell, a Chevron spokesman.

Companies that rely on automated paging also were affected by the satellite snafu.

Wawa, Inc., which operates about 500 convenience stores in the East, uses a paging system to keep employees informed of the progress of automated systems that process sales and store data during the night.

The absence of those notification pages "sparked alarm, but things ran normally," said Tony Ieradi, network and telecommunications manager at the Media, Pa.-based company.

Robert Bednarek, chief technical officer at Greenwich, Conn.-based PanAmSat Corp., which owns the satellite, said he has no idea why the satellite failed.

SCRAMBLE IN THE SKY

PanAmSat said it will take about six days for its backup satellite to move into place to take over Galaxy IV's duties. In the meantime, the company is rerouting some of the traffic to another satellite.

"We expect [that] within a week of the occurrence that virtually all the service will be up and in full force," said Frederick Landman, PanAmSat president and CEO.

The satellite outage sends a warning to businesses about the need for backup systems, analysts said.

Companies that use automatic paging systems to notify technical staff of system problems, for instance, should be especially concerned.

The Galaxy IV satellite failure last week knocked out pager communications and other link-dependent systems

"You shouldn't rely 100% on any one network," said Julie Rietman, an analyst at International Data Corp. in Framingham, Mass.

Satellite outages are rare, with a failure rate of less than 1%, PanAmSat said.

Nevertheless, this incident should be treated as "a wake-up call," said Michael French, an analyst at Insight Research Corp. in Parsippany, N.J.□

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28 Hot air, asserts Dan Gillmor. If the federal crackdown continues, users will get more options, better prices.

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29 [illegible] care companies [illegible] buy store, share data.

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[illegible]

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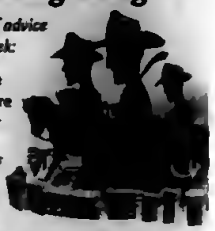

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THE ASSOCIATED PRESS

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Parallel currencies pose challenge

▸ Balancing euro, local currencies could tax current systems

By Thomas Hoffman
NEW YORK

INVESTMENT BANKS that do business in euros starting in January won't get a break from the French franc or the Spanish peseta — at least until 2002.

That's because those companies need to maintain a second set of books through 2002 to record and process transactions in both euros and local currencies for the 11 European nations initially participating in the new monetary unit.

Those requirements are part of the long political process leading to the euro's debut. And because they mandate keeping euro transaction records in parallel with those in existing currencies, they pose significant systems risks, experts said.

MORE ONLINE

Computerworld's resource links on the euro conversion and year 2000 issue can be found under "The euro and the millennium: Between a rock and a hard place?" www.computerworld.com/more

TRANSACTION OVERLOAD

The shift to the euro — expected to fuel an increase in cross-border financial transactions — could overwhelm systems currently in place to store and process all that activity, analysts said.

Balancing currencies "is a big job," said Carla Foti, a member of the euro project team at Brown Brothers Harriman & Co. in Boston. Foti has worked on Brown Brothers Harriman's euro project for more than a year.

Although clearinghouses will begin settling stock trades in euros in January, banks and brokerages will offer their customers the option to buy and sell stocks in euros or local currencies, such as the Italian lira, for three years until the European Union adopts a single currency in 2002.

The 11 nations initially participating in the euro are Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain.

Banks "are not going to be successful [selling financial instruments] unless you can run both [sets of currencies] in parallel," said Scott Moeller, head of corporate development and planning at Deutsche Bank AG in London. Moeller spoke last week at a euro-conversion conference sponsored by the Securities Operations Forum. Moeller said Deutsche Bank has invested $350 million in its euro project, including a backup plan "in case the euro falls apart" for political or economic reasons "and we have to go back" to existing currencies.

Some experts suggest most U.S. companies take too lightly the complexity involved in transitioning their systems to accept the euro.

The Securities Industry Association in New York last month issued a report that found systems that currently manage cross-border stock selling, clearing and settlements aren't ready to record euros and local currencies in parallel.

Financial services firms should write a set of software routines that support both euro and local currencies and roll out the code to all affected applications, said Hal McIntyre, managing partner at The Summit Group in New York. □

Leaving brick and mortar for Web gives IS key role

By Sharon Machlis

THAT DARK-BLUE banner running down the side of Egghead.com? In the old days, marketers decided things like what designs might lure the most customers.

But now that Liberty Lake, Wash.-based Egghead has gone from conventional retailing to World Wide Web-only sales, its information systems department gets involved in many new tasks. "I see more of the operational things moving into the [information technology] group," said Tom Collins, chief information officer at Egghead.com, Inc.

So now he has marketers and copywriters on his staff, along with programmers and systems gurus. Collins concentrates more on the core retailing business and less on technology. And his department does things such as analyze which banners garner the most click-throughs, pass the information on to the marketing department and help figure out what look and feel is most popular with Web surfers.

"IT wouldn't be anywhere close to [being] part of that decision" in the brick-and-mortar world, Collins said. Before the company dropped retail stores, "I was worried about, 'How do I serve the stores?' " Collins said. "Today I worry more about you as an individual coming in to the site."

He now gets E-mail feedback from customers, something that store managers might have dealt with in the past, and has made changes to the site accordingly. Among recent alterations: more powerful searches and recommended best buys.

NOT SO EGG-CELLENT

Fiscal year results for Egghead.com, Inc.

	Revenue	Profit/(Loss)	Inventory
1998	$293M	($50.2M)	$12.9M
1997	$361M	($39.6M)	$49.1M

Egghead announced an 80% cut in its workforce this year, but the IT department has grown by 25%.

"Their lives have taken on a new meaning," said CEO George Orban. "You're operating one store. There's a much greater onus on the technological infrastructure. If the site doesn't work well, you're not doing business."

The company has cautioned that it expects substantial losses for at least two years as it makes the transition to Web selling. In its first quarter as Egghead.com, it said it lost $35 million, which includes a $37.6 million one-time restructuring charge.

Although Orban acknowledged that Internet software sales is a crowded market, he said he believes Egghead.com's strong brand name and marketing deals with partners such as Yahoo, Inc. and GeoCities will help build traffic and sales. Currently, Egghead.com's three online sales sites together make them the sixth most heavily trafficked sites for at-home buyers.

But Rob DeSisto, an analyst at Gartner Group, Inc. in Boston, said Egghead still could face problems matching prices of real-world superstores once shipping costs are factored in.

Egghead.com as of last fall was in third place among online software retailers, according to Simba Information, a Stamford, Conn., consultancy. □

Clinton to stress need for year 2000 work

▸ Part of larger effort to preach preparedness

By Matt Hamblen
WASHINGTON

PRESIDENT CLINTON will deliver an address on the importance of year 2000 preparedness by government and business in the next few weeks, according to his year 2000 czar.

The president's speech will be part of a broader outreach effort by federal officials and will possibly include advertising that stresses the urgency of the date-change problem, said John A. Koskinen, chairman of the President's Year 2000 Conversion Council.

Year 2000 council's John A. Koskinen says there is no time for legislation

Despite the concern, the administration doesn't want to create a panic that could lead millions of Americans to withdraw funds from banks or take other drastic steps, especially when so many U.S. industries expect to be ready in time.

Canada and Great Britain are planning advertisements that urge companies and the public to get ready for 2000. The U.S. is weighing whether that approach will grab the attention of the small companies that Koskinen said are ignoring the millennium problem.

The year 2000 council also plans to set up a World Wide Web site that will debunk the "Rumor of the Week," such as false stories that two European airlines don't plan to fly on Jan. 1, 2000, Koskinen said.

Pressure is mounting in Congress for Clinton and his aides to be more aggressive with awareness efforts and even stronger regulations or legislation. Aides to U.S. Rep. Constance Morella (R-Md.) said she plans to introduce legislation to impose standards for validation and certification of year 2000 fixes.

But Koskinen said there is too little time to consider legislation and too many ways to fix year 2000 problems to adopt standards. "There's no way to standardize a year 2000 test," he said. He also condemned bills (not yet filed in Congress) that would limit the liability of companies fixing software. He said the threat of lawsuits puts pressure on companies to get the work done [CW, May 18]. "I'm happy to have people concerned about that liability," he said.

Since coming out of retirement in February, Koskinen has met with 42 federal agencies to monitor their preparations and has met with major industry executives to discuss sharing information through industry associations. He said he also plans to push the United Nations for more global coordination.

Starting July 1, state governments will begin year 2000 testing of their network connections to federal agencies, he said.

But with all the talk, some industry analysts said Koskinen and his council have kept too low a profile. "I haven't seen a whole bunch of efforts toward better awareness coming out of Koskinen's council," said Stephanie Moore, a year 2000 analyst at Giga Information Group in Westport, Conn. □

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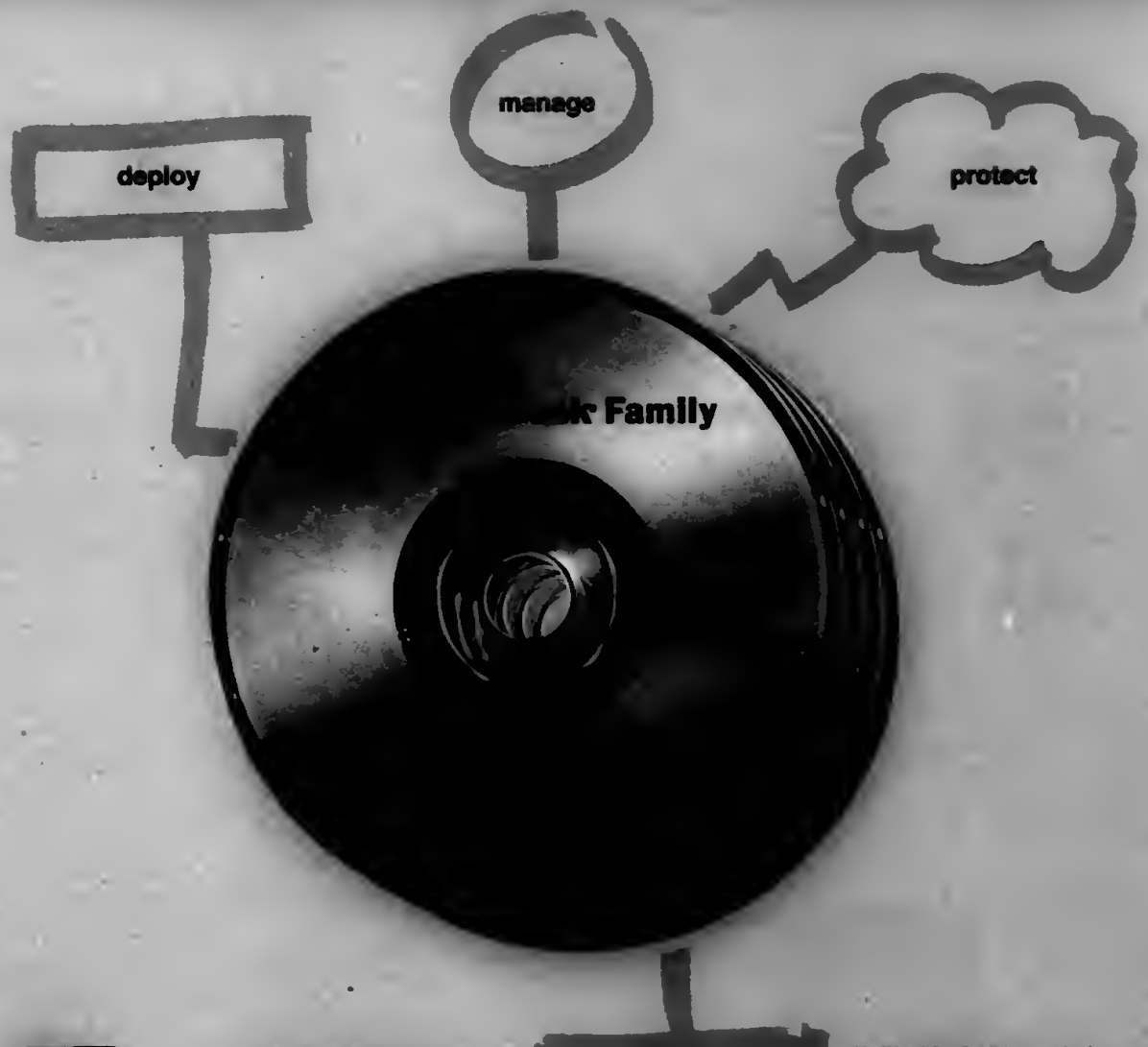

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Ford test-drives used-car Web site

▸ *Project allows two-day delivery from a local dealership*

By Bob Wallace

DOES FOAD really have a better idea for selling used cars?

The automaker has launched a pilot test in which consumers in Houston and Boston can use the Internet to buy used Fords, Mercurys and Lincolns (*www.fordpreowned.com*).

Ford Motor Co. has found it far more difficult to sell those cars than new models — as many used cars are coming off multiyear leases and have up to 36,000 miles on the odometer.

Though Ford is the first of the Big Three automakers to sell used cars over the Internet, World Wide Web sites from companies such as Auto-By-Tel Corp. in Irvine, Calif., already offer direct new-car sales to consumers with Internet access.

Ford's program is part of a trend in which industries that range from PCs to steel, software and office supplies turn to the 'net as a low-cost sales channel.

People using the Internet to buy a car

1996	1.2M
1997	1.9M
2000	5M*

* Projected

Source: J.D. Power and Associates, Agoura Hills, Calif.

ENOUGH SALES?

"The questions we need to answer [are] 'What's the best way of pricing vehicles [and] advertising our Web site?' and, 'Will the sales volume justify an investment to take the program nationwide?' " said Andy McKinnon, leasing business manager at Ford in Detroit.

Jay Houghton, an auto industry expert at A. T. Kearney, Inc. in Southfield, Mich., said Ford's project shows that the auto industry is open to new sales channels. "If nothing else, Ford will learn a lot about the role of the Internet in auto marketing and about used-car buyers," Houghton said.

Chrysler Corp. in Highland Park, Mich., has dealers across the country that close car deals through their own Web sites, a company spokesman said.

General Motors Corp. in Detroit lets consumers shop for certain models as part of a pilot program, but consumers can't finance or buy cars through the program.

Toyota Motor Sales USA, Inc. in Torrance, Calif., doesn't sell cars over the 'net, though some dealers have Web sites where consumers can get limited data, such as cars' sticker prices.

Under the Ford pilot, consumers can check out a list of cars up to 3 years old that provides each car's color (interior and exterior) and mileage. Also listed is a "no-haggle" price and partial-screen photo of the car.

Ford's Web site for used cars lets customers arrange financing and place an order

Car buyers can apply for financing on the site through Ford Credit and order directly from Ford for delivery within 48 hours through the closest dealer.

But Ford may not be able to reach the lion's share of potential used-car buyers because some may not have PCs or access to the 'net, Houghton said.

Another potential problem is that in some cases, Ford is charging more for those cars than similar units on dealer lots or featured in newspaper ads, and consumers want the cheaper deal. Even when that isn't the case, consumers still will want to negotiate a car's "no-haggle" price, said one participating dealer who requested anonymity.

"There's a little haggle in each of us, especially with used cars," the dealer said. He said he fears the program will fail.

McKinnon, who said Ford is trying to improve the quality of car photos on the site, acknowledged that the Internet-pitched cars can be more expensive than similar units on dealer lots.

Customers can test-drive Ford-certified vehicles prior to delivery to their home or office, and they can reject or return them within three days or 300 miles if they are dissatisfied. □

Wearable computers offer up hands-down edge

▸ *More power than handhelds; speech recognition feature improving*

By Kim Girard

WITHIN THE NEXT WEEK, technicians at Ford Motor Co.'s St. Paul, Minn., plant will strap on wearable computers full-time to monitor the quality of paint jobs on Ranger trucks.

The computers, made by Via, Inc. in Northfield, Minn., will let workers speak into a small microphone so their hands are free to feel the truck's exterior for ripples or nicks.

Speech recognition software will translate their words into electronic reports. And if a technician notices a trend — such as a scratch on the paint on four consecutive bumpers — the system will automatically send a warning to the paint shop supervisor.

The system was designed to replace what used to be a paper-intensive process and save time and money.

Wearable computers — small battery-operated devices that fit on a user's head or body via a vest, belt or backpack — are making inroads on factory floors at Ford, General Motors Corp. and Daimler-Benz AG's Mercedes-Benz subsidiary, as well as in hospital operating rooms and U.S. Customs Service inspection stations.

Via's wearable computer is strapped on a belt and used with a headset for voice input

In some applications, wearables are chosen over handhelds because they are more powerful — some offer Windows NT or Windows 95 operating systems, 1.4G-byte hard drives and up to 32M bytes of RAM — and allow hands-free operation.

For example, voluminous training or diagnostic manuals can be loaded on a wearable computer and displayed on a small screen in front of the user's headgear; the user's hands remain free to make the repairs or perform the tasks.

The still-immature market is full of niche products, but the three major vendors are the following:

- Via, which will ship its Pentium-based Via II within several weeks.
- Interactive Solutions, Inc. in Sarasota, Fla., maker of the Mentis multimedia system.
- Xybernaut Corp. in Fairfax, Va., maker of the 2-pound Mobile Assistant II.

The wearables market is showing a few signs of improvement, such as better speech recognition. "Only in the past year has there been a wearable computer that can do work without creating problems," said Kevin Jackson, chief technology officer at Sentel Corp., a systems integrator in Alexandria, Va.

POTENTIAL SAVINGS

Using wearables in the airline industry could bring large savings, said Chris Esposito, a researcher at The Boeing Co.'s applied research and technology unit in Bellevue, Wash. The company has been testing since 1991 the use of wearable computers to help its workers handle massive amounts of technical information.

One of the company's next pilot programs will focus on using head-mounted computers that help workers who build wire bundles for planes — a complex and labor-intensive task.

Using a speech recognition system, workers would identify which of the 10,000 wiring boards they are working on, and the system then would display assembly instructions.

"The technology, I think, is largely ready to do a lot," Esposito said. "It's becoming more a matter of exactly how do we deploy it and integrate it with the rest of the business — within Boeing and the airlines."

But unless you consider your holstered PalmPilot a wearable computer, we are about a decade away from using wearable computers in the everyday office, said Craig Mathias, an analyst at Farpoint Group in Ashland, Mass.

Perhaps they could be used to access the Internet using eyeglasses or communicate via E-mail with colleagues via a wristwatch, he said.

"Today we have the technology to do that," Mathias said, "but not the culture," meaning it will be a while before wearable PCs gain mainstream corporate acceptance. □

MORE ONLINE

Computerworld's links to articles and research on wearable computers can be found under "Wearable computers: digitally attired." www.computerworld.com/more

TO SUSTAIN LIFE OUT HERE, THERE ARE
A FEW THINGS YOU MIGHT WANT TO CONSIDER

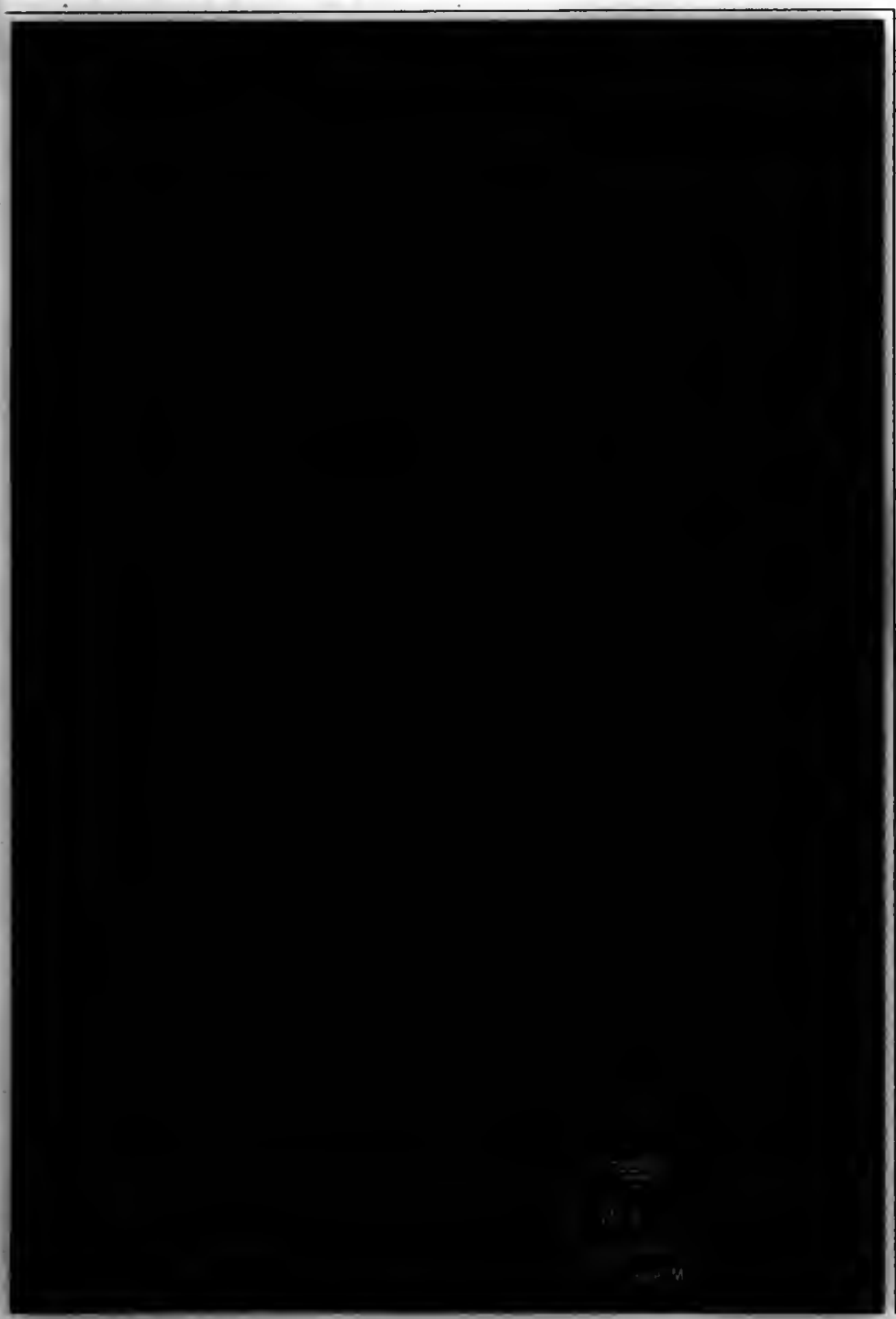
IBM planning to sell its servers to Windows NT users

By April Jacobs

WHEN THE CEO OF IBM publicly laments that the company has blown it by letting rival Compaq "grab" the PC server market, something's afoot.

The company isn't planning any product launches in the near future. But Bill Hughes, vice president of IBM's personal systems division, last week said the company has been quietly deploying a sales strategy since February designed to entice Windows NT users to buy IBM's NetFinity servers.

Under the as-yet unannounced plan, IBM already has marshaled its 12,000-plus sales force worldwide — most important, those who sell into its strong AS/400 and OS/390 market — to work the growing NT-based PC server market.



And with good reason. While desktop PC sales face declining margins, servers are still lucrative. Demand for PC servers has been growing by about 50% per year, said Amir Ahari, an analyst at International Data Corp. (IDC) in Framingham, Mass.

IBM CEO Louis V. Gerstner, who made those comments two weeks ago at an analyst meeting, is being kept up at night by market figures that show Compaq Computer Corp. has run away with the PC server market in the past two years, leaving IBM a distant second. IDC estimates Compaq has a 30.7% share of the worldwide PC server market; IBM trails with a 13.2% share.

Users said IBM has a good shot at selling into its existing midrange accounts, but the company has some work to do.

For example, at Central Illinois Power & Light Co. in Peoria, where IBM midrange systems are in place, Windows NT-based applications run on PC servers from Compaq.

Comments by CEO Louis V. Gerstner prompted IBM to beef up its NT server strategy

"I would say [IBM] needs to market better," said Bud Dowell, senior systems programmer at the utility. He said Central Illinois Power recently migrated some applications to NT, which runs on PC servers from Compaq. But the utility wasn't aware of IBM's strategy in that space.

COMPETITION IS TOUGH

Ahari also said the PC server market is competitive but open to top vendors that make a push to take market share. Palo Alto, Calif.-based Hewlett-Packard Co. is currently in third place, while Round Rock, Texas-based Dell Computer Corp. stays a close fourth. Ahari said he expects vendors will jockey for sales to make up for flagging margins in the desktop arena.

Hughes said IBM is banking on its enterprise experience to take on No. 1, Houston-based rival Compaq.

"You will see our blue suits go in with an AS/400 solution and say NetFinity is part of that," Hughes said. He estimates that half the company's server sales could be NT-based by 2000.

"In every one of our customer discussions, especially looking at the top 300 accounts, we're going to be asking if they need NetFinity and NT," Hughes said.□

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FRANKLY SPEAKING

Where have all coders gone?

FRANK HAYES

WHAT IF ALL the programmers went away? All the code-slinging C++ cowboys. All the careful, methodical Cobol mainstays. All the Web-crazed Java junkies. What if they all left your IS shop?

What if your developers assembled systems by gluing together business functions instead of writing mountains of code?

What if the bottom-line product of your IS shop stopped being programming — and started being business?

Scary thought, eh?

But that's the future — the very near future, according to a pair of analysts at Ovum Ltd., a British consulting company. In a report to be published next month, Katy Ring and Neil Ward-Dutton say IS shops will spend the next five years in a wholesale shift from writing code to assembling software components. No more baby steps. No more toes in the water deploying off-the-shelf systems. You'll be in this up to your neck.

By Ovum's definition, components are prebuilt, self-contained software packages of business functionality. You never modify or improve or edit them. They're black boxes — no user-serviceable parts inside. You just stick them together.

What if the bottom-line product of your IS shop was business?

So much for programmers.

Ring and Ward-Dutton make a pretty compelling case for the shift to components. They're market analysts, so they looked long and hard at packaged software vendors such as SAP and Baan, which have worked for years to turn their huge enterprise systems into bundles of black-box business functions.

They looked at Microsoft and IBM, which are building component support in to operating systems and middleware. They looked at tool vendors that haven't figured out yet that, very soon, all programming will be done by the software vendors that create components — not by IS shops.

LASTING EFFECTS

But what the Ovum analysts didn't really look at is the effect all that will have on the people in your IS shop. My guess is it'll be devastating.

Since the early 1960s, IS shops have defined themselves by the systems they build. They're code factories. IS shops write code, maintain code, enhance code and replace code. Whether it's a batch job, a 3270 screen, a client/server graphical user interface or an intranet application, it all starts and ends with code.

That means that a shift from code to components represents the biggest identity crisis in IS history.

It isn't a crisis for just programmers, whose core role at the center of the IS universe will be gone, but for application designers, who will select components instead of specifying what programmers should write. And it's a crisis for implementors, who must navigate the high-level subtleties of component semantics — with no hope of just hacking out some quick and dirty fixes to make things work.

Maybe most of all, the IS world will change for testing teams. No longer just an afterthought — squeezed in between the slipped schedule and users' screams for their software — your test team will offer the only certainty you'll have that applications work right and that they meet your business needs.

Oh, there will still be programmers. Most will work at software vendors, creating components. A few still will be around your IS shop, keeping legacy systems limping along until they can be replaced.

But for four decades, you've depended on them — their skills, their experience, their weird affinity for data and logic. They've defined your options, capabilities, the very nature of IS as a technical island in a sea of business.

And when they're gone, nothing will ever be the same again. □

Hayes is Computerworld's staff columnist. His Internet address is frank_hayes@cw.com.

SHORTS

Senate OKs visa bill

The U.S. Senate last week passed a bill to let 30,000 more skilled foreign workers enter the country this year and to raise quotas in the H-1B visa program for the next five years. The current cap of 65,000, has been reached with more than four months left in the fiscal year. The U.S. House of Representatives is considering a measure that would require companies to seek domestic workers.

Oracle buys Waterhouse app

Oracle Corp. is adding functions to its applications package that help managers decide whether to make, buy or outsource activities that affect profits. Oracle this week bought Price Waterhouse LLP's Activa software and hired most of Price Waterhouse's Activa development staff. Terms of the deal weren't disclosed.

Informix takes few steps back

Informix Corp., which last month surprised Wall Street analysts by reporting a first-quarter profit, surprised them again last week by taking it all back. The Menlo Park, Calif., database vendor said a restatement of the first-quarter results left it with a $386,000 net loss instead of a $4.9 million profit. The restatement came after Informix's auditors, who have since been replaced, said $6.2 million worth of shipments to companies that build Informix's software in to their own products shouldn't be counted as sales.

New wireless technology

A group of technology leaders have developed a wireless communications technology, code-named Blue Tooth. Ericsson, Inc., IBM, Intel Corp. and Toshiba America Information Systems, Inc. last week announced the Blue Tooth specification. It lets notebook, handheld and mobile telephone users use a short-range radio link to connect devices to the Internet easily and quickly. The technology should be out next year.

Merger raises questions

If WorldCom, Inc. and MCI Communications Corp. want the European Commission to approve their merger, they will have to propose changes to their venture, Competition Commissioner Karel Van Miert said last week. A two-day commission hearing confirmed some concerns about the companies' combined dominance in Internet backbone services. Competitors estimated that the merged organization would control 23% of all trans-Atlantic Internet traffic.

Court denies Intel request

A federal court has denied Intel Corp.'s request for a change of venue from Alabama to California in a lawsuit filed against Intel by Intergraph Corp. The court set June 18 as the date to meet with both parties to establish a time line for the case. In the lawsuit filed last November, Intergraph alleged that Intel is using its dominant market position to coerce the workstation manufacturer into giving up certain key patent rights.

CIOs discuss E-commerce

More than half of all businesses worldwide will adopt Internet-based electronic commerce within the next two years, according to a survey of more than 1,000 chief information officers by Deloitte & Touche Consulting Group in New York. According to the report, industries such as health care and manufacturing are aggressively moving toward electronic commerce. Based on CIOs' current and projected technology use, electronic commerce will be most popular in financial services, with a near-70% adoption rate.

BEA, NCR in middleware deal

BEA Systems, Inc., a middleware vendor in Sunnyvale, Calif., last week signed a deal to buy NCR Corp.'s Top End transaction monitoring software. Top End eventually will be combined with BEA's Tuxedo software to create one middleware offering, the company said. And BEA next week plans to announce a package, code-named Iceberg, that mixes Tuxedo with object request broker software it bought from Digital Equipment Corp.

SHORT TAKES **Dell Computer Corp.**'s first-quarter profits increased 54%, to $305 million. Dell reported a revenue increase of 51%, to $3.92 billion. ... **Novell, Inc.** in Provo, Utah, last week posted revenue of $262 million for its quarter ended April 30, a 4% increase from the same period last year. Profits were $19 million, up 36% from the same period last year. ... **Manugistics, Inc.** said it will report an operating loss for its first quarter ending May 31 because of lower-than-expected sales of its supply-chain management software. ... **Hewlett-Packard Co.** is restructuring its $1.8 billion professional services organization and will focus its consulting and integration services in key areas such as enterprise desktop management services, enterprise resource planning implementations and electronic commerce. ... **Netscape Communications Corp.** last week announced plans for an expanded Netcenter search-engine portal site featuring technology from Digital, Infoseek Corp., LookSmart International Ltd. and Lycos, Inc. ... **Zapata Corp.** last week tried to entice **Excite, Inc.** with a merger offer, but the Internet portal and search engine company scoffed at the deal.

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WANG

Oracle users jury-rig own thin clients

By Craig Stedman
SAN DIEGO

ORACLE CORP.'s thin-client applications are too late for many users who had to take matters into their own hands because the vendor's Windows-based client software was too slow.

The desktop software's speed limits, coupled with a four-month delay in delivering the thin-client technology, prompted companies that use Oracle on wide-area networks to cobble together setups that off-load processing from PCs to application servers, according to users and analysts at last week's Oracle Applications User Group (OAUG) conference here.

Users still are rolling out the jerry-built installations, even though the Redwood Shores, Calif., company now is shipping applications based on its Network Computing Architecture (NCA). And for some, a shift to the NCA software isn't likely any time soon.

NO TIME FOR NCA

"We're getting hit by year 2000 issues now, and we basically want to stabilize this thing," said Tom Pellow, Oracle implementation manager at Transport Canada in Ottawa. The government agency may not switch to NCA for two to three years, he added.

Transport Canada, which sets national regulations for air and water transportation, went live in April with a 700-user installation of Oracle's financial applications. But it put the fat-client software on Windows NT servers, and users run the applications through Citrix Systems, Inc.'s WinFrame PC emulator.

The server-based setup boosts performance on the agency's WAN and makes it easier to add bug-fix patches to the Oracle applications, Pellow said. "Oracle promised NCA last summer, and we certainly would have taken a look at it," he said. "But they didn't deliver in time."

In January, a large consumer products maker turned on a similar Citrix-based Oracle installation that will be used by more than 3,000 workers. Oracle's fat-client software "was simply too slow" to run on remote PCs, said the company's Oracle project manager, who asked not to be identified.

That user also doesn't expect to move quickly to the NCA software. "We spent three years trying to shake the bugs out of what we got from Oracle," he said. "We don't want to switch to another platform now."

Oracle finally shipped an NCA version of its Release 10.7 applications in January. Last week it formally announced Release 11, which runs only in NCA mode.

"People did Citrix, and that was fine with us. We supported them," said Ron Wohl, senior vice president of applications development at Oracle. "But we think NCA is three to five times more efficient on network performance." But users who couldn't wait for NCA still are putting Citrix's technology into production, said Carolyn Waygood, an OAUG board member and head of Sapient Corp.'s Oracle consulting unit in Dallas.

Rockford Corp., a stereo equipment maker in Tempe, Ariz., took another thin-client approach last year by installing Oracle's human resources software on a NetWare server instead of end-user PCs. The company said it plans to switch to NCA by year's end. □

PACKAGED UP

Oracle's Release 11 includes:

- **Intranet-based data analysis capabilities**
- **Support for flow manufacturing processes**
- **Automated workflow for reducing paperwork**
- **Full compliance with euro currency requirements**
- **New marketing campaign-management software***

*** Scheduled to be added next month**

ENTERPRISE MANAGEMENT

Tivoli pioneers share tips

By Patrick Dryden
ORLANDO, FLA.

GRAND PLANS to bring mainframe-class management to thousands of distributed systems are starting to pay off for the hardy few who have finished installing some pieces of the enterprise management software puzzle from Tivoli Systems, Inc.

But they warned other adopters and evaluators that getting this far takes detailed planning, disciplined execution, broad backing and a big budget.

For the first time, information systems managers heard their peers describe implementation experiences and early benefits at the second U.S. conference for Tivoli Systems, Inc. users here last week. Last year, attendees said they felt like pioneers with arrows in their backs when speakers offered only marketing foils and road maps.

NINE-MONTH GESTATION

"Everyone looked at me like I was crazy when I described our nine-month implementation plan last year. But we did it," said Jane Rigsbee, project manager at Blue Cross/Blue Shield of North Carolina in Durham.

Roadblocks were frequent. For example, Rigsbee's team had to start over with a prior version of the Tivoli Management Environment (TME) software when Austin, Texas-based Tivoli's remote control tool wouldn't work with Novell, Inc.'s NetWare. Like other users, Rigsbee said success required expert guidance from Tivoli Professional Services.

Already the help desk has shortened problem-resolution time by using the network to help users instead of driving across campus, she said.

And the automated software distribution tool installed a new application on target PCs in two hours vs. the 30 hours it takes to do it manually, she said.

Stand-alone tools can handle such needs without requiring millions of dollars for licenses, consultation, tool integration and phased implementation of big frameworks such as TME or Unicenter from Computer Associates International, Inc., analysts said.

Yet large organizations hope for significant return from blending end-to-end management functions that way.

For example, TME's integrated tools and processes eventually should reduce management costs by 30%, misconfiguration problems by 25% and recovery time by 25%, said Dave DeMarco, project manager at Eastman Kodak Co. in Rochester, N.Y.

"Buyer expectations are high because Tivoli and CA have overmarketed the whole concept of enterprise management," said Stephen Elliot, an analyst at Business Research Group in Newton, Mass. "Users must work hard and long to see any benefits," Elliot added.

Implementing TME isn't simple "because what we're trying to manage is not simple," said Diana Beecher, chief information officer at Travelers/Aetna Property Casualty Co. in Hartford, Conn.

Operators there monitor about 15,000 network and server events per day and the IS department is about halfway through its rollout of software distribution tools.

After a two-year implementation, central operators at Halifax PLC now can manage 2,500 servers and 30,000 PCs, said Allan Bentley, project manager at the mortgage banker in the U.K. But measuring return on investment for capabilities such as monitoring proactively and preventing data loss is difficult, he said.

Tropicana Products, Inc. has reduced operations staff 20% and provides better service, said Eric Eriksen, MIS director at the orange juice supplier in Bradenton, Fla. The help desk now can solve half the problems with 2,500 PCs and 60 servers "instead of just filling in trouble tickets," he said. □

PAYBACK TIME

The automated software distribution feature is the easiest way to show business benefit from buying management tool bits. An example from Tivoli TME user Florida Power Corp. in St. Petersburg:

The company saves $2.25M by avoiding a typical "sneakernet" installation. Formula: 5 hours at $50 per hour (average salary with benefits) x 9,000 desktops.

New tools assess client/server app performance from user perspective. Page 47

Notes enhancements on tap after acquisitions

By Barb Cole-Gomolski

LOTUS DEVELOPMENT CORP. last week bought two companies that sell real-time collaboration software and will start to put the technology in its Notes E-mail system by year's end.

The messaging giant acquired Lexington, Ky.-based DataBeam Corp. and Rehovot, Israel-based Ubique Ltd. Financial terms weren't disclosed.

DataBeam sells conferencing software based on the T.120 data communications standard, which lets two or more users with T.120-compliant clients edit documents simultaneously. Ubique's offerings include servers for building customized instant messaging and buddy-list applications, which alert users when someone is online.

The buyouts could make it easier for sites to deploy knowledge-sharing applications by making information stored in Notes, as well as the individuals using Notes, available on the fly.

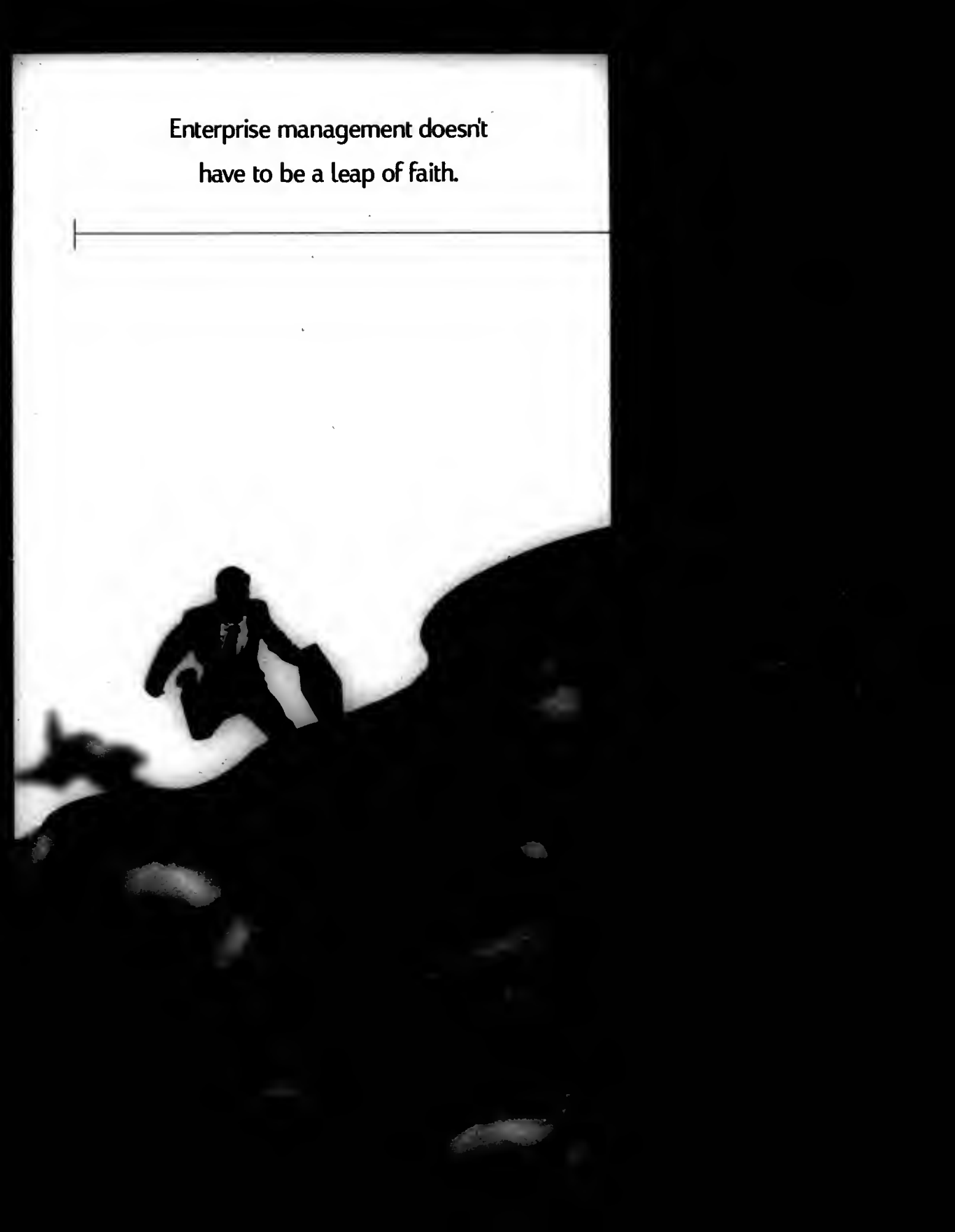
As part of the deal, Lotus plans to give Notes users and America Online, Inc. customers the ability to communicate in real time when online. The feature will be based on technology developed by Lotus, AOL and Ubique.

"The kinds of technologies [Lotus purchased] will be key for doing real-time knowledge management," said Dan Rasmus, an analyst at Giga Information Group in Santa Clara, Calif. The technology helps workers keep track of their colleagues and hold spontaneous meetings on the World Wide Web, Rasmus said.

The acquisitions also further legitimize the market for real-time collaboration tools, which to date have been more popular with Web surfers than corporate users. Last February, Microsoft Corp. acquired Boston-based Flash Communications, Inc. and announced plans to incorporate Flash's instant messaging capabilities into the next version of its Exchange E-mail server.

Jim Turner, technology specialist at the U.S. Fish & Wildlife Service in Portland, Ore., said the technologies Lotus purchased could foster better collaboration. "Sometimes people get into meetings and are pressed for information that they don't have," Turner said. It would help if they could use their laptops to easily check if the real experts are online to answer questions, he said. □

Enterprise management doesn't have to be a leap of faith.



Federal agencies fail security test

By Laura DiDio

WIDE OPEN AND VULNERABLE to attack.

That's how government investigators view the U.S. Department of State and Federal Aviation Administration (FAA) after a 13-month security audit that included "white-hat hacks" on federal networks.

For example, the auditors found numerous weaknesses at FAA air-traffic control facilities that leave certain locations "extremely vulnerable to criminal and terrorist attacks," said Gene Dodara, assistant comptroller general at the U.S. General Accounting Office (GAO).

Results of the GAO report were released last week at a Senate Governmental Affairs Committee hearing.

The lax computer security at federal agencies also could have widespread impact on U.S. businesses and private citizens, said Jack Brock, director of the GAO unit that audits federal information systems.

On a commercial level, Brock said the government does "lots of business" with outside contractors and various trading partners.

And on a personal level, the government maintains information such as individual tax records, Social Security benefits and medical records.

"If these federal networks get hacked, the range of information that even unclassified systems have on government operations, employees, commercial businesses and private citizens alike, is immense," Brock said.

The auditors' findings included the following:

- The GAO's "white-hat hackers" easily penetrated unclassified State Department systems by exploiting lax physical security, dial-up connections and easily guessed passwords.
- The State Department's internal systems managers couldn't detect the invasions.
- The State Department lacks a central focal point for overseeing and coordinating computer security.
- Internet security was the lone area in which the State Department had adequate security.
- The FAA's computer security is "weak to nonexistent." At least one air-traffic control facility gave service contract workers unrestricted network access.
- The FAA hasn't checked physical or computer security at 187 facilities since 1993.

That's surprising, the auditors said, because all federal agencies are required by the Computer Security Act of 1996 to develop and implement security plans to protect any systems that contain sensitive data.

Despite the 1996 directive, the GAO concluded that the "State Department has no information security plan."

The State Department already has begun to implement the GAO's recommendations for beefing up security. But "the FAA is dragging its heels," a GAO auditor said.

In a prepared statement, the FAA said hacker attacks on its systems have been mere vandalism and haven't endangered air-traffic safety. □

Digital Subscriber Line is coming soon

By Matt Hamblen

MORE VENDORS of business-quality Digital Subscriber Line (DSL) equipment and services are scrambling to bring workers faster access to the Internet from their home and branch offices.

Start-up AccessLan Communications, Inc. in San Jose, Calif., today was scheduled to announce gear for Symmetric Digital Subscriber Line (SDSL) service at 1.5M bit/sec., both upstream and downstream.

AccessLan will sell equipment for large businesses and data carriers, including traditional telephone companies and Internet service providers.

Tim McElgunn, an analyst at Gartner Group, Inc. in Delran, N.J., said AccessLan joins an estimated 70 U.S. companies that sell DSL gear or services. He said most vendors are devoted to Asymmetric DSL, which caters to home Internet users.

Some of the largest network gear providers are entering the DSL field, including Bay Networks, Inc. and Cisco Systems, Inc.

AccessLan is unusual among DSL vendors because it lets companies connect their frame relay and IP connections to AccessLan equipment, analysts said. The cost for a 1.5M bit/sec. connection is expected to be less than the cost of a 56K bit/sec. frame-relay connection.

But Copper Mountain Networks, Inc. in Palo Alto, Calif., a competitor to AccessLan, last week said it is working with several competitive local exchange carriers and six customer-premise equipment vendors to make its SDSL products interoperate. The six include Cayman Systems, Inc. in Stoneham, Mass.; and Netopia, Inc. in Alameda, Calif.

AccessLan's success will depend on how well it sells SDSL to large data carriers, including the Baby Bells and Internet service providers, said McElgunn and Rosemary Cochran, an analyst at Vertical Systems Group in Dedham, Mass. □

IPivot helps users set server priorities

By Bob Wallace

SAN DIEGO START-UP IPivot, Inc. next week will announce software that lets users provide different classes of access to servers.

IPivot's Quality of Service Broker server software lets users prioritize access to servers by employee; prioritize applications; and set response-time thresholds for receiving responses from servers.

With the load-balancing software, the administrator of a stock brokerage, for example, could set priorities so a user wanting to buy or sell stock would have priority over someone researching stock or company information.

Today's load balancers spread traffic among multiple servers based on which one is best able to field an inquiry, but there is no way to give one end user priority over another.

Users are split over the benefits of the product.

"It certainly makes sense to have a distinction of service for one class of users over another," said Steve Lopez, network manager at the National Board of Medical Examiners in Philadelphia. To guarantee top performance, Lopez had been setting aside servers just for his most productive employees and let everyone else share the others. "With this software, users could avoid buying additional servers for this situation," he said.

Sheryl Olguin doesn't view the product as a long-term problem solver. "If you're in a position where you need this product, you're running short on server capacity," said Olguin, a network manager at defense contractor Harris Corp. in Melbourne, Fla. "I see it as a stopgap measure until you can afford to bring on more servers."

Quality of Service Broker costs $25,000. □

"Godzilla" images are too much for intranet

By Nancy Dillon

WHEN KAISTEN AANAN'S special-effects design team began work on *Godzilla* 18 months ago, it knew the beast could level skyscrapers with a single tail-swipe.

What it soon discovered was that the giant lizard also excelled at swallowing network bandwidth.

Branan is a producer at Santa Monica, Calif.-based VisionArt, one of four animation studios that collaborated on the TriStar Pictures technothriller, which opened in theaters last week and reportedly cost $150 million to make. Branan said when the four animators met to work out the logistics of animation exchange, the group's battle to tame their own digital creation began.

FIRST TRY

First, the four Los Angeles-area studios decided to try a project intranet. But with just a few animation frames — often equaling several gigabytes — bandwidth constraints resulted in corrupt images and sluggish transmission that made the project impossible. (Interstudio exchanges eventually averaged 50G bytes per day.)

Finally, the group devised an elaborate scheme that involved more than 1,000 transportable 5G-byte tapes from Exabyte Corp. in Boulder, Colo., and countless hand couriers.

"Tape was the best solution because single scenes could span 10 or 20 cartridges," Branan said. "In the baby Godzilla shot, one studio could handle lighting effects on a few tapes while another continued animations on the others."

The constant swapping cut out the waiting involved in an assembly-line approach, Branan said.

Analyst Joan-Carol Brigham said the special-effects artists would have had networking problems dealing with Cinderella, never mind Godzilla.

NOT MUCH CHANCE

"I'm surprised they tried an intranet at all," said Brigham, an analyst at International Data Corp. in Framingham, Mass. "It might work on a huge, fat, dedicated LAN. But over the Internet, not even a T3 [line] could have handled it."

Brigham said vendors such as Starlight Networks in Mountain View, Calif., do offer IP-Multicast software. But, she warned, the tools are better suited for audio and still-picture animations than for high-quality video. □

COLUMBIA PICTURES

Even short animations from the movie *Godzilla* gobbled huge amounts of bandwidth

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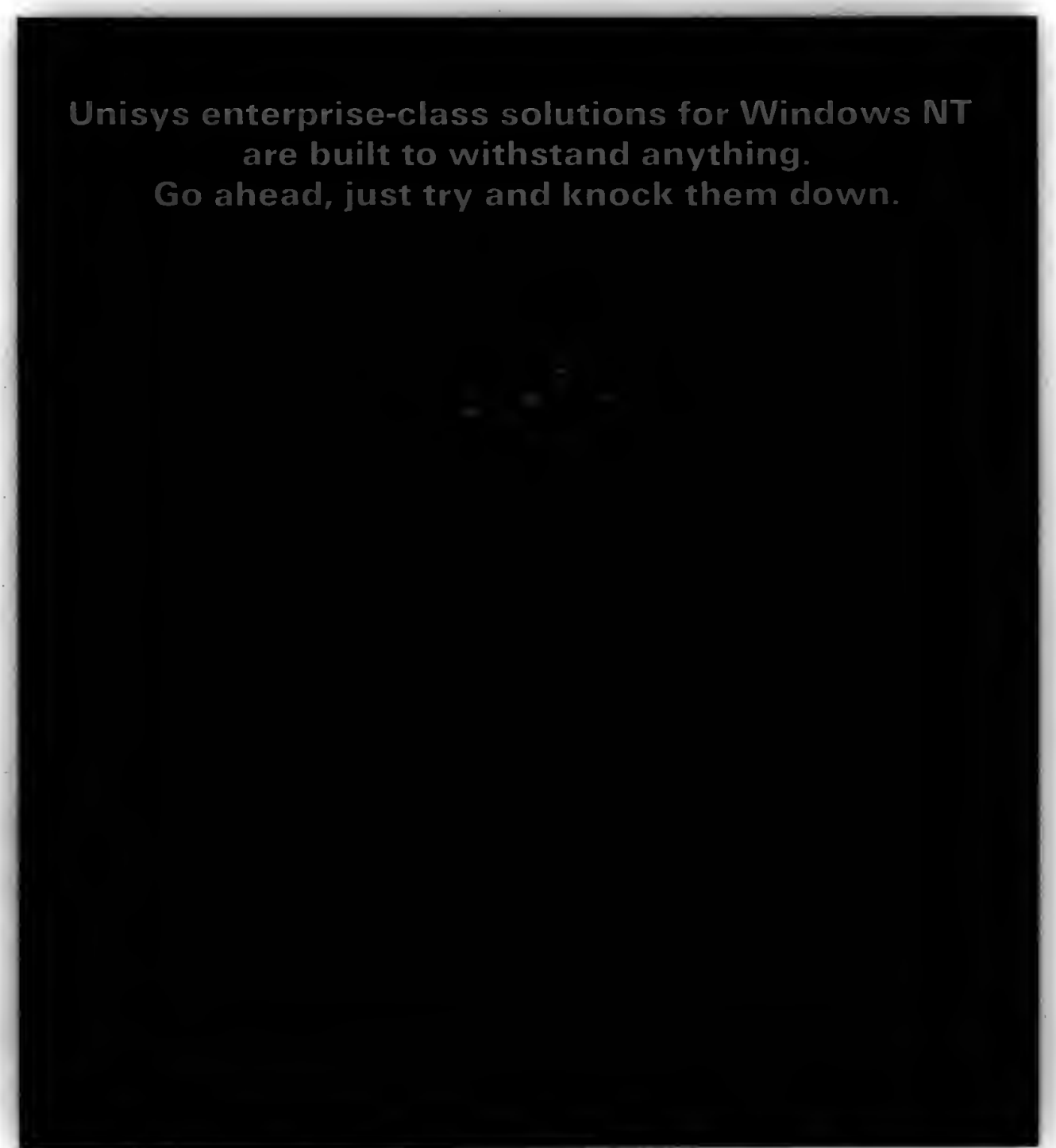

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Recruiters spread Web wings

▸ *Services syndicate recruitment ads across multiple Internet sites*

By Barb Cole-Gomolski

THE PROSPECTS for Web-based recruiting appear to be improving.

Companies have been looking for job candidates on the World Wide Web for several years, but it has been a challenge. Employers have had to cope with multiple recruiting Web sites and few ways to track results.

But that may be changing.

Several companies that run recruiting Web sites have launched services that will syndicate recruitment ads on multiple Web sites.

Until now, recruiters have had to post help wanted ads individually to various sites and pay each Web site for the privilege of doing so. The new services will let companies post an ad once, select the Web sites it wants the ad distributed to and get one bill from the syndicating service.

For example, Reston, Va.-based Best Software, Inc.'s Best Internet Recruiter gives employers access to 6,000 Web sites, while Classifieds2000, Inc. in Sunnyvale, Calif., will take a job posted on a corporate Web site and include it in a database used by more than 100 sites.

Careerbuilder, Inc. in Reston, Va., earlier this month announced CareerBuilder network, an online service that syndicates job postings to multiple Web sites.

SOME POPULAR WEB RECRUITING SITES

Site	Offers
www.careerbuilder.com	Network of Web sites available in one place
www.bestrecruit.com	Network of Web sites available in one place
www.classifieds2000.com	Posts jobs to multiple databases on the Web
www.hrsites.com	Lets users post to multiple sites

EFFECTIVENESS COUNTS

Some of these services also include reporting tools that help companies determine how many hits and resumes their ads are generating.

"That's the key," said Barb Lyman, a technical recruiter at Standard Insurance Co. in Portland, Ore. "It's really hard to track how effective your ads are," said Lyman, who has been using Web sites to recruit workers for about two years.

Web-based recruiting appeals to companies because it is relatively cheap and lets companies reach a broader audience than traditional methods such as print advertising and job fairs.

According to the Employee Management Association in Arlington, Va., Web-based recruiting costs about $377 per hire, while print media advertising runs about $3,295.

GOOD NUMBERS

Such compelling economics may be why companies will spend about $30 million on Web-based recruiting this year and $218 million by 2000, according to Cambridge Mass.-based Forrester Research, Inc.

About 10% of the hires at Texas Instruments, Inc. in Plano, Texas, come from Web-based recruiting. That is up from about 2% in 1995, when the company began using the Web to recruit.

"It's been very successful for us," said Roger Coker, TI's director of U.S. staffing. In fact, TI now has several "cyber-recruiters," full-time employees who find job candidates on the Web.

Coker said the changes the Web-based recruiting services are making will help. But as TI begins to list job openings on its home page, Coker envisions a better way to recruit via the Web. "What I really want is for the [Web-based recruiting] services to simply hot-link back to our site," he said. □

Users hurt by shortage of data interchange pros

By Carol Sliwa

LABOR SHORTAGE pains have hit the companies that rely on experts in electronic data interchange (EDI).

The problem may be small in the context of the overall shortage in the information technology workforce, but it is quite large in the context of the amount of revenue associated with EDI transactions in large corporations.

"If you have no EDI, it can bring a company to its knees. If you have no Java programmer, you may be upset for a couple of weeks until you find a place to buy one," said Howard Rubin, chairman of the computer sciences department at Hunter College in New York and a member of President Clinton's task force on the IT workforce shortage.

TOUGH SITUATION

Attendees at the Sterling Commerce Worldwide Customer Conference held recently in Toronto said the EDI labor shortage is one of the most important problems they face. Consider the following:

- It took Donaldson Co., a Minneapolis filtration systems maker, a full year before it hired Juliane Johnson last fall to work in electronic-commerce information services.
- Two technical EDI positions in the fast-paced retail world have gone unfilled for four months at Toys R Us, Inc. in Paramus, N.J.
- Lowe's Companies, Inc. in North Wilkesboro, N.C., a major home improvement retailer in the South, has two EDI openings, including one that has been vacant for three months.

It is a seller's market when it comes to EDI skills, said Fred Mash, director of corporate trade payables at Lowe's.

"We've not had any strong candidates come forward, and the ones that do are very proud of their expertise and have very high salary requirements," Mash said.

Location hurts many businesses such as Lowe's, which are often in remote areas, some managers said. The nearest large city to Lowe's in North Carolina is Winston-Salem — an hour's drive away.

Gerry Madore, manager of EDI technologies at Bergen Brunswig Medical Corp. in Montgomery, Ala., said he figures qualified EDI specialists can boost their annual salaries by $15,000 to $20,000 if they move from Montgomery to Birmingham, Ala.

The ante rises to as much as $30,000 if they relocate to Atlanta, he said. With pressing year 2000 problems, companies often are willing to open their wallets for potential employees, users said.

MORE ONLINE

For @Computerworld links to articles, standards, publications and resources related to EDI and electronic commerce look at our Web site under "EDI resources" at: www.computerworld.com/more

Consultancies are another appealing lure for EDI specialists. "Because the shortage is so bad, people were given outrageous salaries to move away, especially good people," said Laki Kotronis, manager of systems products in the IT program at Johnson Controls, Inc. The Milwaukee-based maker of heating system controls, has had two EDI positions open for about three months.

IT'S CRAZY OUT THERE

A good EDI worker has a mix of business and technical skills, knows how the business runs and understands how computers work, Kotronis said. "If you train someone and you treat them as you treat any good employee, theoretically, you should be able to keep them. But now you're competing in a market that's crazy," he said.

Opportunities abound for those with skills, industry observers said.

"Fifteen years ago, MIS was where the action was. EDI was new and interesting. Now the world has moved on, and everyone wants to be at an Internet start-up," said Shirley Tessler, co-director of software research at the Stanford Computer Industry Project in Stanford, Calif. □

EDS network created for small banks

By Thomas Hoffman

Electronic Data Systems Corp. this week will launch a service aimed at reducing technology costs by up to 40% for its 850 small banking customers.

Under the program, EDS will support the banks so they can connect to EDS mainframes at the company's Plano, Texas, headquarters.

That way, the banks can process transactions and access customer account histories using cheaper thin-client desktop computers.

The service was designed to relieve community banks from having to install expensive client/server systems to connect to EDS.

The initiative would let customers such as Bank of Commerce in Fort Worth, Texas, use existing PCs as thin clients and add cheaper devices with slimmed-down memory in the future.

"For a bank like us, the immediate cost savings are not having to hire a $30,000 LAN administrator we were beginning to need," said Adrian Mayces, a senior vice president at the bank, which has assets of $155 million.

Each time the Bank of Commerce opens a branch, it typically has to install six workstations, Mayces said. Network computers would reduce its hardware costs by $500 per workstation, he said.

That is critical to community banks valued at $500 million or less, because their information systems budgets as a percentage of noninterest expenses are typically half that of banks valued at $20 billion and more, said Patricia McGinnis, an analyst at The Tower Group, a financial services research firm in Newton, Mass.

McGinnis said the network computer-based architecture should give bankers greater flexibility with their existing systems and let them improve customer relationship management.

EDS set up the networking architecture jointly with Sequent Computer Systems, Inc. in Beaverton, Ore.

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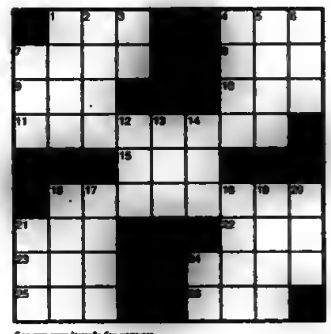
ACROSS

1. See logs
4. Curvy
7. Place
8. Honest ___
9. Allies; abbr.
10. Tennis shot
11. Count on
15. Pair
18. NT - out!
19. Mister
23. Server need
23. Little bit
24. Dress edges
25. Stitch
26. Serious software

DOWN

1. For Pete's ___?
2. Eurasian range
3. Not there; abbr.
4. ___ & chain
5. Clarinet's kin
6. Net subset
7. Golfer's goal
23. Give ___ rest!
13. Hole punch
16. Snake that hugs
16. Trig function
17. Moire
18. ___ rabbit
19. Cook's home
20. Double curve
21. Help
18. This guy



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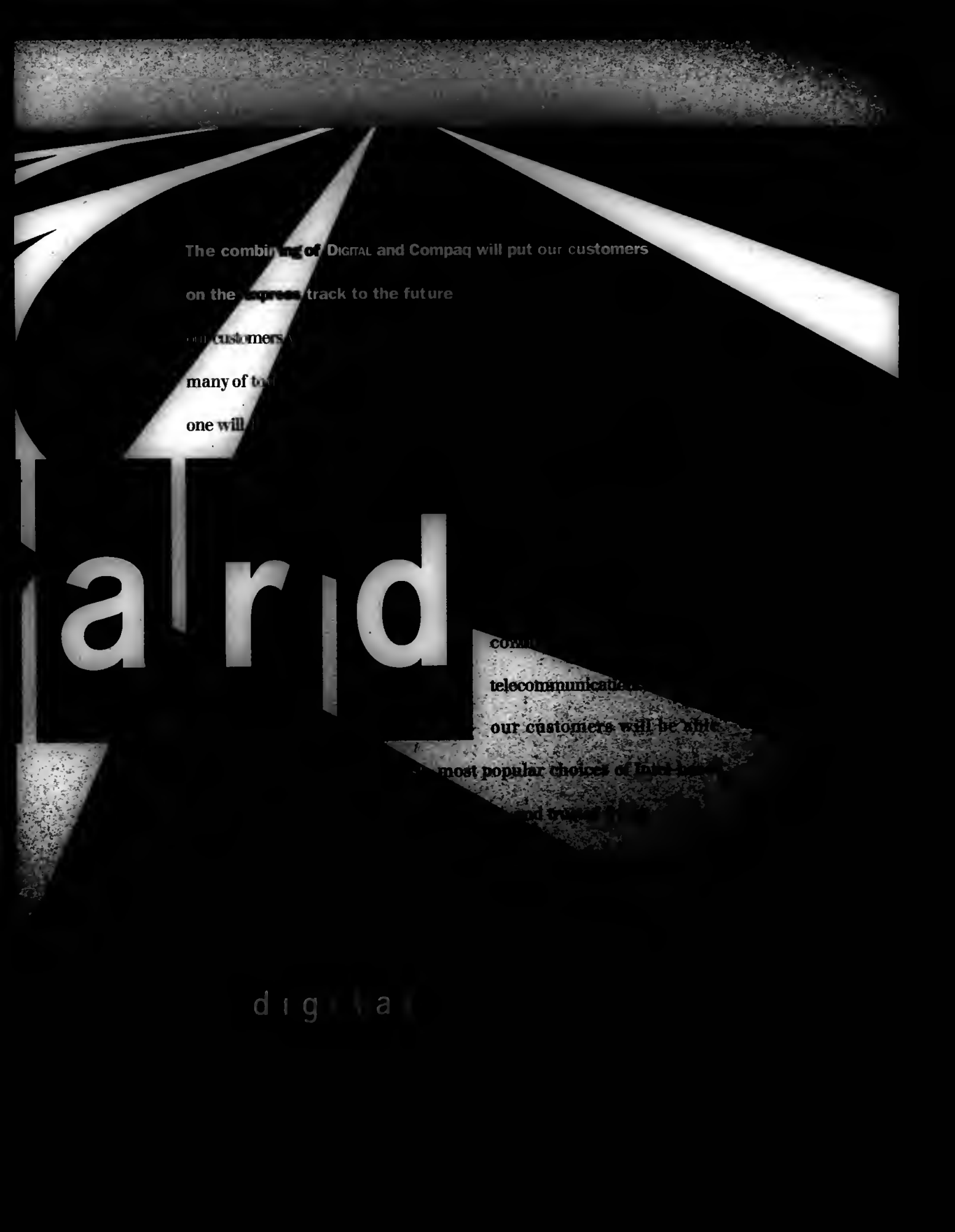
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our customers
many of to
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telecommunicati
our customers will be able
most popular choices of
digital

NetWare 5.0 delivers the goods, but slowly

By Laura DiDio

USERS TESTING the final beta of NetWare 5.0 in preparation for its summer debut praised the long-awaited availability of native TCP/IP and support for large amounts of data storage.

At the same time, the users said, the major drawback in the final NetWare 5.0 beta is the sometimes slow performance of its new Java-based management utility. "This is still a beta version. We're aware of the performance issues with the ConsoleOne Java management utility, and we'll have it fixed by the time NetWare 5.0 ships this summer," a Novell, Inc. spokesman said.

As a result, most of the dozen businesses interviewed by *Computerworld* said they will move to deploy the new Novell operating system in production networks within the next six months.

"NetWare 5.0 looks like it's going to be a really good product," said Vic Thiedek, a network analyst at Cargill, Inc., an agricultural products manufacturer in Minneapolis.

BILL ARMOUR

Dana Corp.'s Jeff Dazell: "Novell's actions don't impact us. Our corporate directive is Windows NT all the way."

Thiedek said the native TCP/IP support performed well. He said the new Novell Storage Services file system architecture, which was designed to increase network scalability by supporting large volumes of data storage, improved NetWare's overall performance. "It also improves the time it takes to recover from network outages," Thiedek said.

Cargill has a mixed NetWare and Windows NT environment, and upper management hasn't yet made any final upgrade decisions. "I'm impressed with the NetWare 5.0 beta, and I gave my download to upper management, so it's in their hands. It will let us easily manage an entire division of 50 servers," Thiedek said.

Marcus Senior, LAN and client development manager at Kaiser Permanente, Inc. in Silver Spring, Md., said the NetWare 5.0 beta's fine performance so far will make it easier to persuade management to upgrade.

"It's all great stuff, especially the [Novell Director Services] for NT product, which is crucial in our mixed NetWare and Windows NT networks," Senior said.

Oswald Seerattan, a systems engineer at Electronic Data Systems Corp. in Toronto, said he was impressed by the spate of new NetWare add-ons — especially NDS for NT and ZenWorks, the new NDS-enabled desktop management suite. "ZenWorks could help me cut my management time in half by letting me administer desktops through NDS," Seerattan said.

But for some users, Novell's and NetWare's renaissance came too late.

Jeff Dazell, LAN administrator for network services at Dana Corp., a $7 billion automotive parts manufacturer in Toledo, Ohio, said his company decided more than a year ago to switch from NetWare to Windows NT. "Novell's actions don't impact us. Our corporate directive is Windows NT all the way," Dazell said.

Users also reported some minor bugs — most notably slow performance related to the ConsoleOne Java management utility.

"Right now it's running like a tortoise. . . . That's a real drawback when you're trying to do network setup," said an MIS manager at a large New York brokerage firm.

Scott Webster, MIS manager at Canadian Occidental Petroleum Corp. in Calgary, Alberta said, "But I look at it this way: NetWare 5.0 has to have fewer bugs than the upcoming Windows NT 5.0 because the new release of NetWare has only 10 million lines of code vs. about 32 million for NT." □

OS/2 Warp servers need apps

▸ *Users await IBM's Aurora, Java programs*

By Laura DiDio

OS/2 WARP SERVER users said they like IBM's plans to bolster enterprise management and backup capabilities in the next release of the operating system.

But what they want most, they said, are Java-based applications to compensate for the current dearth of OS/2 Warp Server applications.

Once Java applications from third-party vendors arrive in force, the current lack of off-the-shelf applications for OS/2 Warp Server will be a moot point, users said. Users, most of whom work in banking and financial services, said only a few dozen applications for OS/2 are available. By contrast, there are hundreds of applications for Novell, Inc.'s NetWare and Microsoft Corp.'s Windows NT Server.

IBM recently outlined feature and delivery plans for the next generation of OS/2 Warp Server, code-named Aurora and due early next year, said Jeff Smith, director of IBM's OS/2 business line management group in Austin, Texas. The new OS/2 version will have its own Java Virtual Machine to speed the performance of Java applications. It also will be year 2000- and euro-compliant, Smith added.

JAVA'S ALLURE

The availability of Java applications holds the most allure for OS/2 Warp Server shops, although information systems managers at only two of eight Fortune 1,000 companies contacted are widely deploying Java applications.

"I want Java-based, operating system-independent applications to move out of the realm of promise and into reality," said Bill Peel, a senior technical manager at Bank of Montreal's main data center in Toronto.

The bank deploys OS/2 Warp Server in 450 branch offices to support 6,000 users. Peel said he considers OS/2 very reliable for critical applications, but he added that he "continually justifies" the bank's OS/2 Warp Server use to upper management.

"If Java applications fail to materialize, we eventually may be forced off the platform because of all the hype against it and for Windows NT Server. The top executives always want to know why we're not going all Microsoft," Peel said.

The other IS managers agreed. But all said they remain committed to OS/2 Warp Server for the foreseeable future. There are compelling reasons to keep it.

"We've got a big investment in OS/2 Warp Server. It's stable, gives us high network availability, and we have a skilled staff in place," said Steve Douglas, a senior vice president at Chevy Chase Bank in Chevy Chase, Md.

The $6 billion bank has 4,000 OS/2 Warp Server users. But because Java-based applications have yet to hit the street in force, the bank is moving its departmental applications to run on Windows NT servers.

Bill Teags, information systems manager at Advanced Package Engineering Corp. in Phoenix, said he gave OS/2 Warp Server high marks for running InnoVal Systems Solutions, Inc.'s J Street Mailer, a full-function E-mail client written entirely in Java. "I tried it on OS/2 Warp and Windows 95, and it ran faster on Warp," he said.

Most users said they will stick with OS/2. "We're loyal to Warp Server but it's not blind loyalty. We'll wait to see what IBM delivers and whether or not the promise of Java materializes," Douglas said.

According to International Data Corp. in Framingham, Mass., OS/2 Warp Server's market share is holding steady at about 14%.

NetWare holds close to half of the network operating system market, and Windows NT has about 30%. □

MORE ONLINE

@Computerworld has links to organizations, resources and publications related to OS/2, under "OS/2 resources." www.computerworld.com/more

Features of Aurora, the next version of OS/2 Warp Server, include:

- New command line graphical user interface
- Automated backup of large networks
- Ability to back up data on multiple devices
- 30% faster performance via Journaling File System
- Enhanced Web server capabilities
- Pricing not set, but no "dramatic increase" from the current OS/2 Warp Server Version 4.0 price of $799 per server license
- Available early next year

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Bandwidth-poor users opt for a quick fix

By Bob Wallace

AN ONSLAUGHT of new bandwidth-hogging applications and a lack of time to deal with them have forced some users to blindly throw switches at network problems instead of carefully planning growth in capacity.

Plummeting prices for high-bandwidth switches make it easier for users to just keep buying equipment until slowdowns go away, rather than monitoring the network to find sources of congestion, according to a recent informal poll of information systems managers.

"We're firmly in the overbuild and ignore camp," said Thomas Hayes, telecommunications manager at Boston Chicken, Inc. in Golden, Colo. "We've had explosive growth in the number of employees and have had to overbuild our network to keep pace. And since it's just me running our data network as the result of a downsizing, I don't have the time for monitoring."

The fast-food chain had a Token Ring network, but replication data from Lotus Notes servers ate up available bandwidth.

The company installed Ethernet switches to solve the problem. "We overbuilt to the point where we seldom, if ever, hear user complaints," Hayes explained.

"The problem is widespread, and we've seen users Band-Aid problems for years," said Craig Johnson, president of PITA Group, a Portland, Ore., research and consulting firm. "It's getting worse because IS resources are being pulled to year 2000 and Web projects."

KEITH ATTUMASSO

Val-Pak's Alan Robson: The firm's IT staff doesn't have time for proactive bandwidth planning

Coupon giant Val-Pak Direct Marketing Systems, Inc. has some monitoring tools, but its technical staff doesn't have the time for bandwidth planning, according to Alan Robson, MIS manager at the Largo, Fla., company.

"We'd love to do proactive bandwidth planning, but we've got so many projects going that we are throwing bandwidth at the network on a per-application basis," Robson said.

BUYING TIME

Val-Pak is rolling out SAP AG's R/3 business automation software, which will let far-flung franchisees enter orders more easily.

It is also upgrading a heavy-duty graphics system that handles coupon production. The system —125 Macintosh computers with connections to a Unix file server — generates an average of 363G bytes of data per month.

Robson said he wants to avoid the slowdowns that happen when users move large files by switching from 10M bit/sec. Ethernet to 100M bit/sec. connections.

"Once we get these projects behind us, we'll have time to focus heavily on bandwidth planning instead of just doing it in a rudimentary way," Robson said.

Other users lay some blame on the people who roll out applications that create problems for those who maintain the network.

"Programmers write bad client/server applications that don't take bandwidth requirements into consideration," said Jim Fey, director of strategic technologies at PMI Mortgage Insurance Co. in San Francisco.

"A bad client/server application is one that requires too much data to be sent from servers to clients. Most of it turns out to be unneeded, but the volume taxes the network," Fey said. □

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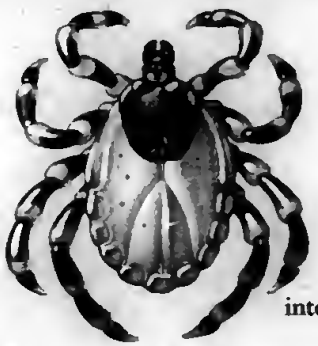
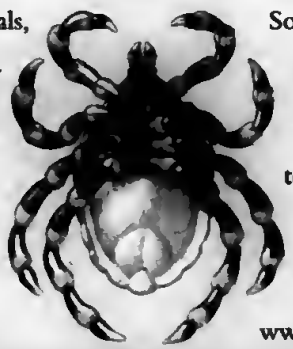


dorsal view



ventral view

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FROM THE EDITORS OF

COMPUTERWORLD

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Intranets

A MONTHLY LOOK AT WEB DEVELOPMENTS BEHIND THE FIREWALL

Unraveling the Riddle

LDAP could simplify intranet administration, but at what cost?

Brian Bloom faces a tough challenge. As manager of global finance Web services at NationsBank in Chicago wants his far-flung organization to have faster access to key bank and group services data. So he's creating tools to allow remote employees — and even authorized bank customers — to see this data as if they were attached to the corporate intranet.

Similarly, Federal Express Corp.'s Jim Candler, vice president of personnel systems, is convinced that enabling employees to see and update their personal human resources data is

INSIDE THE MASTER VIEW, PAGE 3 SAMPLE SERVERS, PAGE 6 DIRECTORY PROJECT, PAGE 7

Continued from page 1

a good thing. So Candler and his HR team have created an environment that lets employees inside a firewall authenticate themselves and query and alter their own data through a special FedEx browser.

For Jeremy King at Bay Networks, Inc. in Santa Clara, Calif., the challenge goes beyond access and authentication. For the project manager of this leading internetworking company, consolidating security applications and maintaining users and groups on the corporate intranet is proving to be more than a day's work.

Though these companies and their issues have little in common, they do share a technology remedy. It's the Lightweight Directory Access Protocol — or LDAP — a networking protocol that allows end users to more easily navigate the choppy, disparate directories of the rough distributed computing waters.

NationsBank, FedEx and Bay Networks are all in various stages of piloting and implementing LDAP, which they believe will empower users by giving them more control over corporate information.

How so? As an access protocol that comes with a Web browser or mail client, LDAP has opened up possibilities as never before for businesses. Suddenly, end users have the ability to do information lookups, adds and deletes. Administrators can pull information from native application directories into LDAP-based directories and open those up to the corporate intranet, and, by extension, the extranet.

LDAP's popularity stems largely from being a lowest common denominator, according to Doug Simmons, vice president of consulting services at The Radicati Group in Palo Alto, Calif. And though LDAP provides access to disparate data sources, it is limited to name, address and phone number-type information, Simmons points out.

RAPPROCHEMENT

LDAP (a pared-down version of the X.500 access protocol, known as Directory Access Protocol or DAP) has found quick and universal acceptance among traditionally warring competitors. Developed at the University of Michigan, it is easier to implement than DAP, which is very resource-intensive. The functionality provided by LDAP is lighter weight, but Version 3.0 of the protocol has addressed some of the shortcomings by offering, for example, strong authentication.

"THE LDAP MARKET will be impacted by Microsoft's [Active Directory] but not elimineted by Microsoft."

TIM SLOANE, ABERDEEN GROUP

By providing a common interface, LDAP facilitates synchronization of directories across distributed E-mail and other database servers. But while it is popular right now, Microsoft Corp.'s new Active Directory may change the equation, networking experts contend.

And contrary to the claims of LDAP evangelists, the protocol does face other challenges. "LDAP gives us a better opportunity to develop an enterprise directory, but in and of itself does not give an enterprise a consolidated enterprise directory because legacy directories are not based on LDAP," says Gary Rowe, principal at Rapport Communication in Roswell, Ga. "To bring this together, [we need a] new class of products."

In the absence of tools, organizations are developing their own. Ehorn's staff at NationsBank has written custom scripts to extract information from different directories residing on Oracle Corp. and Sybase, Inc. databases distributed throughout the country. The data is then imported into Netscape Communications Corp.'s Directory Server, Version 3.0. In other words, they are aggregating information from multiple sources and putting it into a directory service, which can be used by a certain Web-enabled population.

"The clients of our directory will be a variety of Web applications that require user authentication, or user profile information that may be stored in the directory," Ehorn says.

The use of LDAP will also enable NationsBank to eventually build extranets and leverage the integration of the rest of the Netscape SuiteSpot line, Ehorn says. This approach will "lower the cost of ownership because of centralized administration and [will] decrease development time as applications have one data store about people and groups," he explains.

RATIONALIZING SECURITY

Security is key for Bay Networks, as well. Before June 1997, when Bay saw its first LDAP implementation, the company had a number of security systems, King says. "We had Web developers in each department, each with their own security," he says. "As Web developers sprouted, they created their own security systems."

The result was the creation of as many security systems as applications. Some users could have up to 15 passwords. King said the company is down to about six security systems and the

COVER PHOTOGRAPH BY KURT GERBER

number will go down even more.

King has ambitious expansion plans. For example, he wants to implement digital certificates and use the directory server as a store for public keys. Some applications, such as the New Product Introduction Tool, are extremely sensitive and not all employees on the corporate intranet will have access to them. "It's here that digital certificates will come in handy," King notes.

FedEx, on the other hand, is using LDAP not only for humans to communicate with machines but for intranet applications as well. Although all of its applications are still in beta, FedEx has created a system using software from Entrust Technologies, Inc. in Richardson, Texas.

Employees sign on through Entrust. Each employee gets a certificate that is also stored in the LDAP-based directory. This means that, unlike in the Internet model, a user's certificate does not have to be stored on a particular PC, Candler explains. This does not tie a user to a particular desktop and makes administration a lot easier in an organization where thousands have intranet access.

Once in the directory server, employees have access to "self-service" HR information. Seeker Workplace from Seeker Software, Inc. in Oakland, Calif., provides access to all HR databases, regardless of the platform. Users can change their phone, fax or beeper number, for example, on the HR server.

Salaries and other changes can be made by managers, and all the rules for those are stored in the directory server. In the case of a terminated employee, HR updates the personnel server and all related information across the network is changed at the same time.

The directory server is also the repository for workflow rules. "Our LDAP directory stores workflow enablers — job code, supervisor level, location code, boss, pin number of boss," Candler says. "Client/server applications have access to that data." This means that an application that does expense reports or purchase orders can obtain information, such as who is the signing authority on a particular expense, from the directory server, he explains.

VENDOR BANDWAGON

So while consumers in the business world are rushing to find new ways to use LDAP to bring data within easier reach, vendors are rushing to express their support for LDAP as much through action as through the spoken word.

What vendors like about supporting LDAP is that they each see their product in the center of the directory universe. With a common standard, the focus moves from access to ease of implementation and performance. "As more people write LDAP applications, it takes the spotlight off access and puts it on the back end of the directory," says Michael Simpson, director of product marketing at Novell, Inc. in Provo,

Continued on page 6

Seeking a Master View

A meta directory, says Gary Rowe, principal at Rapport Communication in Roswell, Ga., sits in the middle of disparate directories and lets them communicate with each other. "It understands relationships among various directories, so it can tie them together using an overarching directory structure, like X.500, and weave together various directories," Rowe says.

LDAP could be the protocol used, he contends, because of its universal acceptance.

The chief draw of the meta directory — currently provided by vendors such as Control Data Systems, Inc. in Arden Hills, Minn., and Zoomit Corp. in Toronto, Canada — is that unlike directory synchronization, which merely takes information from different native directories and spits it back out, the meta directory creates a person object into which it puts all the information about that person. It thus does away with the redundancies of traditional directory systems.

Also, unlike X.500, it does not require information to be fully mapped to the native directories, Rowe says.

The Sloane, an analyst at Aberdeen Group in Boston, says the meta directory is a concept only partially implemented today, but the concept can be taken to different extremes.

And there will be learning curves to master as people push the meta directory concept a little too far and find that as they try to store too much data in too wide a span of control, management becomes a headache. Then they will have to scale back, he says.

The best use of meta directories, at least with currently available products, is to solve a specific problem, such as managing employee names across applications.

"That's a bold strategy and it can be done," Sloane concludes.

ILLUSTRATIONS BY DAVID BLACK

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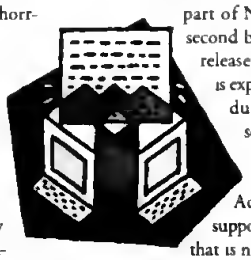
Continued from page 3

Utah. "The question then becomes, 'Which [directory] is more reliable, secure and manageable,' " he says.

And all vendors think their products fit the bill. Users and analysts, however, know that LDAP has its shortcomings.



For one, users need to understand the new technology, says Rick Waugh, systems analyst at BCTelecom, Inc. in Vancouver, Canada. You have to figure out the directory schema, what information should be presented to users and what the hierarchy should be. "It doesn't come out of the box ready to go," he says. "It needs design work."

NationsBank's Ehorn recognizes the challenge. Doing schema definition, identifying data sources for schema, providing links to pull existing information into directories, and LDAP-enabling all the applications in use at the bank is time-consuming and can become political as departments squabble over ownership issues.

One area that becomes especially challenging is trying to obtain pieces of information from data repositories, bringing them to the LDAP directory server, and keeping the record keys in the server, Simmons says. The idea is to use the record key to look for additional information on the back-end database.

META DIRECTORIES

A new concept is emerging that defines these directories that manage pointers to other databases. The term "meta directory" came into industry parlance a little more than two years ago. It is used to denote both directories that store pointers as well as one gigantic directory, such as an X.500 directory, that is a repository for all information. Two key features of a meta directory are that it has the intelligence to scan and look for similarities among entries, and it provides centralized management (see story page 3)

Meanwhile, the real challenge to LDAP may come from Microsoft's Active Directory, which will be part of NT Version 5.0, the second beta of which will be released later this year and is expected to become production-ready by the second quarter of next year.

It is true that Active Directory will support LDAP natively but that is not all it will support. On the front end, it will provide the Active Directory Service Interface, which will let independent software vendors write the applications that use the Active Directory; on the back end, Object Linking and Embedding Database or OLE DB — an interface for accessing different types of data regardless of location — will provide access to relational and nonrelational data sources.

For example, "Active Directory will have a ton of new object classes, attributes and object relationships, which are useful only in the NT/Exchange/Wintel environment," Radicati's Simmons says. "These objects have unique names, syntax, object identifiers [and] matching rules, which are not going to be recognizable to non-Active Directory browsers and directories, such as LDAP."

Active Directory may, therefore, limit the proliferation of pure LDAP-based directories that Netscape has been championing. "The LDAP market will be impacted by Microsoft, but not eliminated by Microsoft," says Tim Sloane, an analyst at Aberdeen Group, Inc. in Boston.

Netscape, however, sees meta directories as an interim solution until LDAP becomes more firmly entrenched. "Over the long term, LDAP will make meta directories irrelevant, says Frank Chen, group product manager at Netscape in Mountain View, Calif.

The meta directory issue is a growing one but may not really impress itself on the industry psyche for another two years, industry watchers said.

While some companies will choose something off center and off standard, such as Active Directory, so that they can couple their directories more tightly with their operating system, others will take a different approach, Sloane believes. They will say that the extranet is important to them and they need standards to manage NT and other platforms. And the way to do it will be through LDAP, he contends.

Mohan is a freelance writer in Los Altos, Calif.

Not Lightweight *(to them)*

A SAMPLING OF SERVERS THAT SUPPORT LDAP

LOTUS DEVELOPMENT CORP.
Currently shipping: Domino Directory, Version 4.61 with LDAP 2.0.
Future release: Version 5.0 with LDAP 3.0

MICROSOFT CORP.
Currently shipping: NT 4.0, Windows NT Directory Services does not support LDAP.
Future release: NT 5.0 with Active Directory will support LDAP 3.0.

NETSCAPE COMMUNICATIONS CORP.
Currently shipping: Directory Server, Version 3.0 with LDAP 2.0.

NOVELL, INC.
Currently shipping: NDS 4.11 with LDAP 2.0.
Future release: NDS 5.0 with LDAP 3.0.

PROJECT: CORPORATE DIRECTORY

And One Directory For All

By Steve Alexander

Parsons Corp., an engineering and construction firm in Pasadena, Calif., will begin using Lightweight Directory Access Protocol (LDAP) as part of a plan to link more than 100 remote small offices and construction sites to its corporate network. An LDAP-based universal corporate directory will initially provide organization charts, employee telephone numbers and personal information. Later the directory will be expanded to include an existing company intranet and a new extranet that will have hundreds of Web pages about individual work projects. Hayes Latin, project manager at systems integrator Perot Systems Corp. explains the project.

WHAT THEY'RE DOING

The LDAP directory will be used to capture data about all the people who need to access information in the organization, including contractors, subcontractors, consultants, partners and employees. We want to categorize users by the organization they are with, the projects they are on and the levels of access they have.

BENEFITS

By having a centralized directory, you put the data in once. When people leave, you can remove them from the central directory and know they have been removed from all applications.

The universal directory also will automate something that has been largely manual. To find someone today, you'd often have to call a building and talk to the guard station. The larger buildings had their own directories, but there was no central directory.

When the corporatewide intranet and extranet are rolled out in six to eight months, they will help the company promote collaboration. People will be able to send documents and drawings back and forth to the remote sites.

HOW THEY'RE DOING IT

Parsons will deploy Oblix, Inc.'s IntraPower Suite 2.5, a tool that allows IS to assign security rights to each field within the LDAP server. Using Oblix, Parsons can say that certain fields are updateable by users, while others are updateable only by company officials. In the future, Parsons will limit the fields to determine what can be viewed by whom. Parsons hasn't decided whether LDAP will run on Windows NT or Unix.

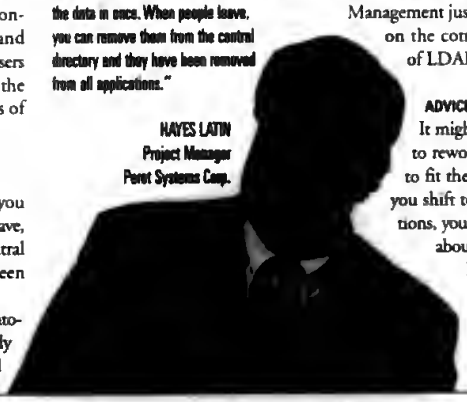
TECHNICAL CHALLENGES

The plan is for any new application in the next three to six months to be LDAP-compliant. But it's questionable whether this will work because some mission-critical applications aren't LDAP-compliant and won't ever be. We may have to maintain separate directories for our homegrown financial system, which runs on an IBM AS/400, and our homegrown materials management system, which runs on an IBM RS/6000. It might be too much of an effort to make those legacy systems work with an LDAP directory.

The company must figure out how to replicate the directory database to other servers in the network.

"By having a centralized directory, you put the data in once. When people leave, you can remove them from the central directory and they have been removed from all applications."

HAYES LATIN
Project Manager
Perot Systems Corp.



TOOLS

In addition to IntraPower, Netscape Directory 3.0 is the directory server.

COSTS

The LDAP directory and the Oblix interface were justified by the universal corporate directory function. IS was sold on the network security and application security aspects.

RETURN ON INVESTMENT

Management justified the expenditure on the convenience and utility of LDAP.

ADVICE TO OTHERS

It might be too cumbersome to rework legacy applications to fit the LDAP model. But if you shift to Web-based applications, you need to be concerned about security. That's where LDAP is of value.

Alexander is a freelance writer in Edina, Minn.

WHAT'S ONLINE

For an expanded view of this project with RealAudio clips, point your browser to www.computerworld.com/intranets

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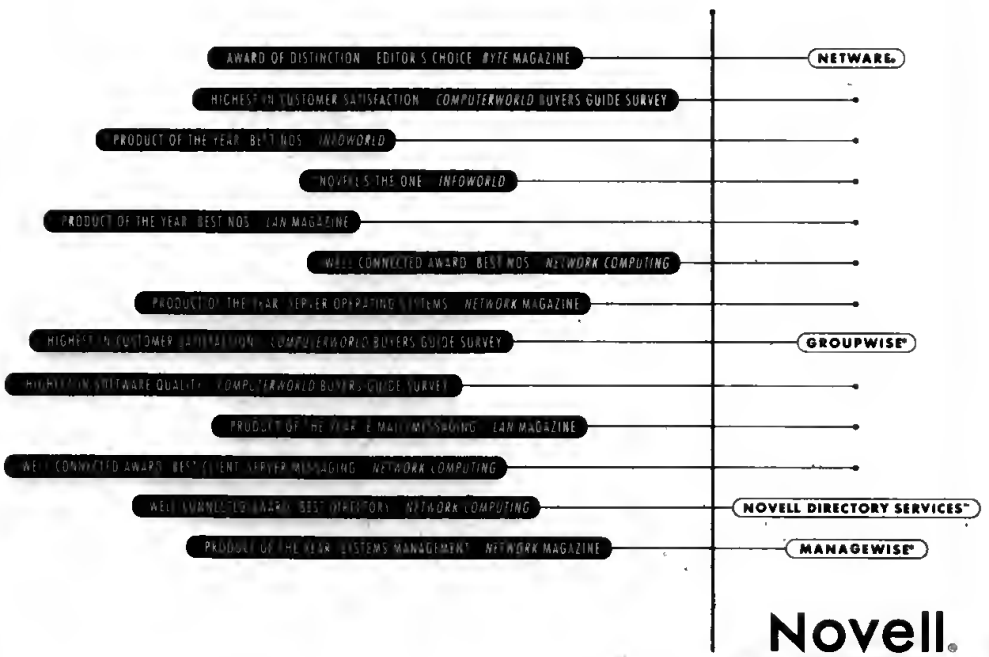
PHOTO BY GARY MOSS

EVER WONDER WHICH NETWORKING COMPANY THE EXPERTS RECOMMEND?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COMPUTERWORLD

QUICK STUDY

Hot trends & technologies in brief

Wireless data technology

DEFINITION: Technology that uses high-frequency radio waves to let mobile users send and receive data on a LAN or via fax, E-mail or the Internet when they are away from the main office. Services for transporting wireless data include Cellular Digital Packet Data, packet radio systems and personal communications services.

Mobile workers could expand usage

By Kim Girard

WIRELESS DATA SERVICES such as two-way paging, wireless E-mail and wireless fax are still plagued by a few stubborn problems, limited coverage, vexing pricing schemes and too many competing services.

AT ISSUE

Growth in number of mobile users is driving the market

But the nationwide growth of mobile workers demanding access to the Internet and corporate LANs is expected to increase the rather limited wireless data usage during the next several years, analysts say.

Currently, 64% of remote users connect to networks via analog modems, while only 4% use wireless technology, according to Stamford, Conn.-based Gartner Group, Inc.

UNIVERSAL COVERAGE

Service providers that are upgrading analog systems to digital networks also will contribute to the growth of the wireless data service market by making it easier to get wireless coverage in more and more locations.

Indeed, most observers agree that the lack of universal coverage is the single largest factor holding back the wider use of wireless data services.

Market revenue was estimated at about $3.1 billion last year and is expected to triple by 2000, according to Frost & Sullivan, a Mountain View, Calif.-based consultancy.

Users planning a long-term wireless strategy should bank on Cellular Digital Packet Data (CDPD) because it's IP-based, says Gartner Group analyst Bob Egan. The beauty of that approach is that any applications users already have on their laptops will work on a CDPD network.

ERIC YAHC

CDPD is "the only strategic [wireless] investment for companies today," Egan says.

But Iain Gillott, an analyst at Austin, Texas-based IDC/Link, a unit of International Data Corp. in Framingham, Mass., questions whether CDPD is worth incorporating into a strategy at all.

CDPD so far has fewer than 25,000 users nationwide compared with the 125,000 subscribers AT&T Corp signed up last quarter for its new personal communications service (PCS), Gillott notes.

SERVICE IS KEY

Gillott says complicated services such as CDPD won't really catch on because there are other, less complex ways for users to get what they need.

"The killer application for wireless is voice," Gillott says.

Another problem with wireless data services is the confusing way they're priced: by the number of minutes used or as a flat rate that lets the user send a fixed amount of data. Users also have had to deal with long-distance vs. local charges, surcharges, taxes and other tolls that vary by geographic region. But that issue is going away slowly as the industry moves toward flat-rate pricing services. AT&T and Bell Atlantic Corp., for example, both now offer wireless services at flat rates.

Dan Merriman, an analyst at Cambridge, Mass.-based Giga Information Group, says the demand for wireless data services will increase as coverage and service improves and cost goes down.

"I don't see a huge spike," he says. "But as all of those issues get continually addressed, the market will expand across the board."□

QUICK STUDY ONLINE For research and related *Computerworld* articles on wireless data, go to *www.computerworld.com/more.*

WIRELESS TECHNOLOGY/SERVICES

Cellular Digital Packet Data (CDPD)

Data transfer rate: 9K bit/sec.

Description: A system overlay for sending and receiving data over cellular networks.

Pro: The network is IP-based and has a relatively low cost of entry, and there is a trend toward flat-rate, unlimited usage plans.

Con: Only 59% of the U.S. has access to the service. CDPD has fewer than 25,000 users nationwide, compared with the 125,000 PCS subscribers that AT&T added last quarter.

Packet radio systems

Data transfer rate: 4.8K to 19.2K bit/sec.

Description: Ardis and BellSouth Mobile Data built these national networks. They are mostly used by field workers in the utility, delivery and dispatch businesses. Those networks are best suited for data messaging and niche applications. They're not quite suitable for general enterprise use.

Pro: National networks provide end-to-end coverage; very reliable; flat-rate pricing.

Con: It's expensive and slow.

Personal communications services (PCS); includes CDMA and GSM networks

Description: A two-way digital wireless service that was initially offered for paging but is now used for voice. Sprint, AT&T and a growing field of other carriers offer PCS, which boasts clearer voice quality. There are three technologies being used by PCS carriers – Global System for Mobile Communications (GSM), Code Division Multiple Access (CDMA) and Time Division Multiple Access (TDMA).

CDMA

Description: A cellular standard and the dominant technology for PCS networks in the U.S.

Pro: It will provide faster service and high bandwidth for data.

Con: Limited availability. Lets user receive data on PCS phone, but doesn't let them send data.

GSM

Description: A digital cellular network used worldwide for voice/data messages. It uses TDMA technology, which divides radio frequencies into slots. So one frequency supports multiple data channels. GSM networks are built to handle data calls, allowing connectivity to a dial-up network.

Pro: Network is used worldwide.

Con: GSM phones lack built-in connectivity to a PC and require a PC card adapter that can cost as much or more than the phone. The service is standard in Europe, but isn't widely used in the U.S.

■ *Are there technologies or issues you would like to learn about in QuickStudy? Send your ideas to QuickStudy editor Stefanie McCann at* ***stefanie_mccann@cw.com***

.WORK THE
WEB.

LOvE AND DEAtH in Akron, Ohio.

The pharmaceutical sales rep is dead. Exhausted. Dog meat. Lying on the bed, he thinks about his day. His flight was delayed two hours. He went into the club lounge and connected to [1](the company intranet to review shipping status on pending inventory) via the Web. He [2](e-mailed) his customers to inform them their deliveries would arrive early. He lugged his carry-on to the gate. He wedged himself into a coach seat. He arrived at his sales call just in time, only to find his client was running an hour late. He tweaked his presentation, checking his competitors' Web sites, and [3](incorporated key points into his pitch). He made the presentation. He went to the hotel and the smiling clerk gave him a smoking room with twin beds instead of the non-smoking king he had reserved. He turned on a rerun of *Love, American Style*. He connected to the [4](contact management system), updated his customer file and sent a call report to the global sales team. He connected to the company benefits intranet and [5](calculated the balance in his 401k plan). It was up 4.5%. He falls asleep and sleeps soundly until his next wake-up call. At 5:30 a.m.

THE [6](BEST PARTS) OF HIS DAY WERE MADE POSSIBLE BY LOTUS.

[1]Lotus Domino™ Web Application Server with IBM DB2® UDB back-end. [2]Lotus Notes® mobile messaging. [3]Notes replication. [4]Domino-based Contact Management application developed by Lotus Business Partner. [5]Lotus eSuite™ spreadsheet applet. [6]www.lotus.com/workthewab.

Lotus

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OPINION

Follow the data

With all the thunder and lightning surrounding the federal government's antitrust lawsuit against Microsoft, I assumed corporate IT executives would be mighty jumpy about the fate of the desktop dominator.

Wrong.

I learned that firsthand last week while touring the IT operation of an automaker. Like so many of his peers, the chief technology officer at this manufacturer follows stories about Microsoft's struggles with keen interest — but with zero angst.

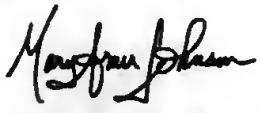
Why so little hand-wringing? Because of a basic business reality: Microsoft doesn't own the automaker's corporate data. SAP does. The German enterprise resource planning vendor has essentially become the corporate operating system of the next decade, with other integrated application systems from Oracle and Baan close on its heels.

"If I had to rip SAP out of my data center, I would feel very serious pain," the CTO said. And he said he wouldn't be any happier about having to replace his Oracle database or Digital Alpha Unix servers, which run everything from financials, distribution and invoicing to a host of mission-critical applications that control or assist his factory production.

But the worst that could happen to his 3,500 desktops? "Maybe a delay in rolling out the next Internet browser? No big deal," he added with a shrug. "The real question is, who has your data? That is the vendor you worry about."

I heard much the same story from IT executives at Priscilla Tate's Technology Managers Forum, held recently in New York. One after another, business-savvy technologists said they admired Bill Gates and his fabulous wealth but disapproved of Microsoft's more predatory business practices.

Were they losing sleep over the antitrust action? Could their businesses be hurt by whatever happens to Microsoft? No on both counts. Microsoft's troubles may ultimately make it harder for IT to plan desktop strategies and may even raise costs in some areas, as our exclusive survey in this week's issue shows (see story, Page One). But the enterprise data — the lifeblood of your company — is safe from that storm.



Maryfran Johnson, *executive editor*
Internet: *maryfran_johnson@cw.com*

LETTERS

When crises dominate, vital issues can be ignored

MANAGING department editor Allan E. Alter's column in the April 13 issue ["To boost retention, inspire loyalty," CW] was excellent, although I suspect there will never be enough attention paid to those issues.

A psychologist and I have written a book on the subject, *Leading With Something Other Than Your Chin: A Guide to Organizational Leadership*. It will be published later this year. I am the specialist in this company on human resources issues, and it is very discouraging to note how many people want to ignore those issues in favor of the crisis of the moment.

Albert I. LeDuc
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Get out of Microsoft's way

THE GOVESNMENT should drop its case against Microsoft because it is Microsoft's competitors that are conspiring to restrict competition.

The government has no business restricting Microsoft or any other business. Such a restriction is a form of a monopoly in which some businesses have an unfair political advantage. Microsoft has no political power. It offers its products freely to consumers, who get to vote with their wallets.

The real issue is whether the government prosecutes America's best and most productive companies in order to appease their jealous competitors.

Harold Almon
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Eight hours per day at the office should be enough

REGARDING THE "Singled Out" Ms. MIS column [CW, March 23] by Laura DiDio: We are all missing the main point.

Many employers assume that workers should give their life to working nights, weekends and holidays. It's no wonder that we haven't been giving enough attention to our children and ourselves.

> Our society needs to get back to the eight-hour workday

It's not that single employees are given more work than married ones; rather, our society needs to get back to the eight-hour workday. We do have a life in the five hours left each day after work. Why give it to your employer?

George M. Knochel
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IRS needs rigorous testing

THE IRS STILL cannot overhaul its information systems operation any more propitiously than it could five years ago ["IRS takes another stab at modernization," CW, March 30].

The IRS has done a remarkable job of telling the American people how well it failed.

Billions of dollars have been spent on similar projects in the past, which yielded only such things as thousands of spurious audit letters.

What the IRS needs is a person who can implement rigorous design and testing procedures.

Jonathan R. Verlin
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Hype won't inspire the next generation of IT workers

MY ADVICE to those who are pondering the shortage of technology workers is to forget about trying to hype IT. Get the kids interested in creating with computers, and they'll find their way to IT sooner or later.

Especially get them interested in the technical aspects of it. Get them curious about what's really going on under the hood. Show them something neat and appealing, and then show them how it was done. Make it clear that it's not magic and that real work went into it.

There are a lot of artists who are working as technical people in the computer industry. They blend the mental and creative aspects of themselves into a single focus.

That is one reason they spend so many hours programming and such.

It's their way of creating what they envision.

Mark Miller
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***Computerworld* welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.**

Top consultants are MIA on year 2000

William Ulrich

As year 2000 strategies shift from the computer room to the boardroom, one wonders why management consulting firms are largely ignoring the issue.

Executives are realizing that critical business functions may be stalled by year 2000 system failures and supply-chain problems. To address that challenge, management must commission a project audit and risk assessment, formulate contingency plans and develop crisis-management strategies.

When requirements such as those arise, CEOs typically turn to management consultants. But just when they're needed most, management consulting firms have turned their backs.

Who are those management consultants? They include the Big Five accounting firms and other consulting companies that offer strategic planning services. Those firms shun technical work associated with year 2000 projects. There are exceptions to that hands-off policy; at the local level, several accounting firms are helping their key accounts.

The big five accounting firms shun technical work and fear lawsuits.

But those exceptions are dictated by personal relationships that would be strained by a denial. At the national level, it's hard to find a management consulting firm with a coordinated strategy to help companies through the year 2000 transition.

Why would those companies turn their backs on corporate America? One reason is that they believe year 2000 work to be beneath their stature. We might have forgiven them a couple of years ago, when people thought that fixing the year 2000 problem meant fixing code. But mitigating business risks stemming from year 2000 goes well beyond code. Risk management — the only option for most companies as time runs out — requires working with business units, manufacturing plants, supply chains and business partners.

Management consultants are best suited for that type of work because it cuts to the heart of strategic planning and corporate survival. That's what they're supposed to do!

Another factor is fear of liability. One indicator of that fear is evident in a recent year 2000 article that quotes the International Federation of Accountants on the subject of auditing: "To avoid any doubt or misunderstanding, the auditor explains to management that the year 2000 issue does not create any new responsibilities for the auditor, and that it will be addressed by the auditor only insofar as it affects existing audit responsibilities." That's a thinly veiled cop-out based on the fear of being sued.

The biggest factor that keeps management consultants out of the year 2000 loop is a lack of understanding about how they can help mitigate year 2000 risks. Ignorance is never an excuse, however, and significant requirements abound.

One way consultants can help involves performing a year 2000 audit to assess how well a company's project is doing. Another way focuses on ensuring that critical systems are fixed and tested in a business-based, priority sequence that avoids back-loading risks into late 1999.

The risk assessment also looks at non-IT systems and electronic and physical supply-chain risks. Management consultants also can help create business-based contingency and crisis-management strategies to help companies prepare for the new millennium.

The demand for those services will be filled, at least in part, by smaller firms that understand the strategic demands inherent in most year 2000 initiatives. But that help may come too late for many companies. Management consultants should step to the table now, before time runs out. □

Ulrich is president of Tactical Strategy Group, Inc. in Soquel, Calif., and executive vice president of Trauxys Research LLC. He is co-author of The Year 2000 Software Crisis: Challenge of the Century *(Prentice Hall 1997). His Internet address is tsginc@cruzio.com.*

Microsoft lands in the briar patch

John Gantz

So, the gummint is going to war with Microsoft. That will be great for industry. Not your industry, if you're a computer user, nor the software industry, but my industries: consulting, research and journalism. The antitrust suit filed last week will bring Microsoft-watching to a whole new level.

I don't think it will do much for the rest of the world, however. It looked to me at the congressional hearings as if Microsoft's biggest problem with the government was that it didn't have a headquarters in enough states. Do you think Sen. Hatch would care about Internet browsers and PC operating systems if Novell didn't have its headquarters in Utah?

The government's motive has nothing to do with choice in the market and everything to do with politics. The ostensible reason for preventing Microsoft from bundling a browser with Windows 98 is so that PC suppliers can choose which software they put on their machines.

Do you think they care? What matters to suppliers is whether the software they put on their machines works together and whether users want it. They *like* Microsoft — Windows 98, NT 4.0, new browsers — because those things sell computers.

This suit won't do anything for PC suppliers, except make them spend money on consultants and researchers to keep track of what's going on.

For Microsoft, going to trial isn't the worst thing that could happen. It will focus the software company's legal energies and give Microsoft yet another way to use its market power to strategic advantage.

I was around during the antitrust case against IBM, and one thing I learned is that civil servant lawyers are no match for the kind of high-paid legal talent monopolies can afford to hire. Microsoft's lead counsel will probably have a salary bigger than the Justice Department's budget. The company's lawyers will do their worst to stretch out the trial for years.

By the time it ends, browsers, Windows 98 and PC operating systems may be obsolete.

LOST CAUSE?

In the interim, PC vendors still will bundle Microsoft browsers with their PCs, even if they technically don't have to. Resellers still will line up behind the launch of Windows 98, because where else can they get a few dollars of extra margin? The other anti-Microsoft forces still will have to compete against a powerful, aggressive monolith, and Microsoft *still* will be the most powerful company on the planet.

For IS, the trial will be a sideshow. CIOs won't lose any sleep.

For computer users, the trial will be a sideshow — something consultants, researchers and journalists get excited about, but not many others.

Surely some law students will write papers on the impact of technology on antitrust statutes. But CIOs and IT managers won't lose any sleep.

I think Microsoft landed in the briar patch. Like Brer Rabbit in the Uncle Remus story, the company has been tossed into an environment it calls home: a contentious, messy situation in which gobs of cash can help solve problems.

And that will inflame the paranoia in Redmond. Everyone will work even harder than they do now, devote more of their soul to the company and rally around Chairman Bill.

With Microsoft's spine thus stiffened, competitors will find it even harder to compete. □

Gantz is a senior vice president at International Data Corp. in Framingham, Mass. His Internet address is jgantz@idcresearch.com.

Silicon Valley torn over antitrust suit

Dan Gillmor

Be careful, the saying goes, you may get what you ask for. That maxim seemed appropriate last week in Silicon Valley after the Justice Department and 20 states fired their antitrust howitzers at Microsoft.

Yes, a company widely believed to have abused its position was finally being called to account. But even those who cheered the antitrust moves had to realize that the relationship between the government and the technology industry had changed in a fundamental way.

Silicon Valley has never viewed Microsoft as the only dangerous Bigfoot. It also sees government through extremely cynical eyes. Both views are entirely appropriate. They're also somewhat inconsistent.

A crackdown on Microsoft was long overdue, and IT professionals will be big winners over time if the crackdown ensures real competition. Hardware prices have dropped enormously in recent years, but software price drops have occurred only where competition flourished. And Microsoft, squeezing competition off the desktop, has been raising some of its prices.

Even those who cheer realize the government's role in IT has changed fundamentally.

The company's claim that the Justice Department and states' attorneys general are attacking the company's ability to innovate is plain silly. Microsoft has published some excellent software, but its principal innovation recently has been in business tactics. One notable example — and a key reason for the antitrust investigations and lawsuits — is the bundling of disparate software into one package.

But Silicon Valley's pleasure at seeing the government finally do something about Microsoft is in sharp conflict with the tech crowd's frequently libertarian political tilt. Of course, that disdain for government hasn't stopped many tech companies from accepting taxpayer handouts. Military dollars have rained in Silicon Valley for decades. Nevertheless, you can feel the unease among tech people as they watch the government go to war with Microsoft.

The truth in Microsoft's panicky statements reflects legitimate concern. At all levels, government tends to muck things up as much as, if not more than, it helps. And as more than one IT executive has noted, government works at about a tenth the speed of the industry. Internet Time — the compression of decision-making, marketing, product development and product cycles — leaves people less time to reflect as the velocity of change increases. And reflection is a verifiable good thing, even if some in IT consider it an unaffordable luxury.

But Silicon Valley is properly alarmed at the prospect of governmental interference in its daily goings-on and is terrified that a new industrial policy may emerge from bureaucrats' minds. No one wants to see the government decide what can and cannot go into a product.

But it's wrong to say that the pace of technological change makes antitrust laws moot or less essential to consumers' well-being. Microsoft's conduct has been an advertisement for stiffer enforcement, as was IBM's in an earlier era. That's why it will be vital to keep the government's feet to a new fire. Just as the IT industry pushed the Justice Department toward a hard examination of Microsoft's business practices, the industry must now push equally hard to avoid the kind of overreaction that would hurt it, and worse, customers.

In every war, innocents die — a concept known by Pentagon obfuscators as "collateral damage." IT will need to watch carefully to ensure that it doesn't wander into the line of fire. □

Gillmor is technology columnist at the San Jose Mercury News. *His Internet address is dgillmor@sjmercury.com.*

Telco mergers are the least of our worries

David Moschella

Why is everybody so against the proposed SBC Communications/Ameritech merger? And why are so many people so quick to pronounce the 1996 Telecommunications Reform Act a failure?

It may be true that today's merger mania is spinning out of control. But of all the megadeals announced thus far, this one seems among the most benign, perhaps even a bit sad. It isn't even the biggest news in telecommunications; WorldCom/MCI Communications is a much more potent combination.

To restore a little perspective, let's review some history. Thirty years ago, AT&T pretty much controlled America's telecommunications infrastructure. Since then, government policies have effectively eliminated one monopoly business after another. In 1968, via the so-called Carterphone decision, the government forced AT&T to allow non-Bell equipment to be connected to its networks, opening the door for today's fierce competition in telephones, modems, faxes and other end-user equipment.

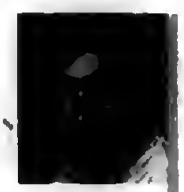
In 1978, the federal government formally allowed long-distance telephone competition, legitimizing the efforts of MCI. Then, in 1982, it courageously broke up the Bell system itself. That led directly to heightened long-distance competition and much more open telephone equipment markets, symbolized by the eventual spin-off of Lucent Technologies. Following divestiture, local telephone service was the only remaining telecom monopoly. So far, so good.

But that last monopoly was a very strange one. The price we paid for opening up other telecommunications segments was to create seven new local monopolies. It was a bit like telling Microsoft it could sell its software only in the Southwest. But overall, it was a trade-off worth making, and the focus of government policy has shifted to opening up that one last area.

To paraphrase the tag line of former New York Mayor Ed Koch, "How are we doing?"

Well, competition for local wireless telephone services and local Internet access is so brutal that sustainable profits are often all but impossible. The cable television industry is still powerful but lives in fear of the potential cost advantages of direct broadcast via satellites. Local phone service is the only real monopoly left, but major competition seems right around the corner.

Whether the strongest challenge comes from cable TV, wireless personal communications services, Internet telephony or low-Earth-orbit satellites remains to be seen. Eventually, today's RBOCs will almost certainly be on the defensive.



Why does it matter if we go from seven local monopolies to four?

Given all that, it's hardly surprising that the RBOCs might want to circle the wagons. But how do any of their mergers actually hurt consumers? Why does it matter if we go from seven local monopolies to four? Local telephone rates are still regulated, so even if competition somehow fails to emerge, there's still the same built-in check we've always had.

RBOC initiatives in nontelephony areas have failed so consistently that no one could argue that they will unfairly expand their monopolies.

Seventeen years into the Wintel monopoly, I wish the prospects for real PC industry competition were so bright. It's amazing how much computer people love to bash the telcos, given our own industry's proclivity to produce much more powerful — and totally unregulated — monopoly entities that also do whatever they can to protect and expand their vital interests. SBC/Ameritech should be the least of our worries. □

Moschella is an author, independent consultant and weekly columnist for Computerworld. *His Internet address is dmoschella@earthlink.net.*

Corporate Strategies

Case Studies • Trends • Outsourcing

Briefs

Kmart data center

Kmart Corp. has announced plans to build a $103 million data center behind its Troy, Mich., headquarters. The 86,400-sq.-ft. facility, slated to open in June 2000, is expected to help the retailer improve the reliability and productivity of its merchandise and operations systems. It is also aiming to support future growth. Kmart had considered options such as outsourcing or moving its data center operations or moving to a new location in Kentucky, Nebraska or Colorado before it received $24.5 million in tax incentives to remain in Michigan.

Hospitals fear 2000

One in seven British hospitals has no confidence that its information systems will survive the turnover into 2000, according to newly published research. A report from the National Audit Office, called "Managing the Millennium Threat," said less than a third of the trusts that run regional hospitals have been told to get systems millennium-compliant by the end of this year, and less than a third of them will be able to meet a year's end compliance deadline. Health service managers rejected the recommendations of the report. They said they need more money and technical support rather than more bureaucracy in the form of filing progress reports and contingency plans.

Top five technology threats:

Data security	45%
Virus attack	45%
Hardware/software failure	25%
Failure of backup software	25%
Power surges	25%

Base: Random survey of 100 Fortune 1,000 IT managers; multiple responses allowed

Source: Input, an international IT market research firm in Mountain View, Calif.

Hospitals face info overhauls

▸ *Federal rules alter how data is stored, shared*

By Barb Cole-Gomolski

SOME ARE CALLING it the year 2000 of health care.

Federal regulations expected as soon as next month as part of the Health Insurance Portability and Accountability Act (HIPAA) will change the way patient information is stored and shared in hospitals nationwide.

KIRSTEN JOHNSON

Putting standards in place where none currently exist could make it easier for health care providers to share electronic medical records with doctors, insurance companies and patients. The regulations also should improve the confidentiality of medical records by creating guidelines for keeping patient information secure.

Still, for many companies, HIPAA will require an overhaul of their health care information systems, said Tim Sullivan, chief information officer and senior vice president at Kaiser Permanente Health Plan, Inc. in Oakland, Calif.

"Companies will have to go about this in much the same way as the year 2000 issue," Sullivan said. On the plus side, he said much of the health care industry is installing new systems anyway as part of a move toward electronic medical records.

The HIPAA rules will cover how to conduct transactions, identify patients and keep patient information private and secure. Rules on security could come as soon as next month. Others, including privacy rules, won't be complete until next year. Firms will have two to three years to comply with the regulations once they are final.

Among other things, HIPAA regulations will require companies that wish to use digital signatures and encryption to follow certain guidelines. Those security technologies will enable doctors to sign medical records and ensure that the records aren't forged or tampered with.

IBM earlier this month announced a line of software products and consulting services aimed at companies that need to meet the HIPAA standards.

IS managers in health care companies said the impact of HIPAA will depend on how many legacy systems the organization has. Kaiser is in the midst of implementing a nationwide clinical information system that keeps an electronic health record of each patient and will work in HIPAA compliance as the company goes along, Sullivan said. At a minimum, health care firms will be required to convert their current patient identification system to one based on the new standard.

"We don't want this to be another year 2000, where we

Health care, page 42

BIOMETRICS

Body parts securely ID users

By Laura DiDio

A PICTURE IS worth a thousand words — or maybe just one when it's a password.

Some leading-edge businesses are finding that stored images of fingerprints, eyes or other body parts may help tighten security and save untold dollars by reducing the risk of fraud.

Biometric security techniques supplant traditional password and user logon IDs with systems that minutely examine the unique pattern of a user's finger, palm or hand; blood vessels in the eye; sound of their voice; or curve of their signature.

"Biometrics goes beyond passwords and raises the bar for identifying computer users," said Bill Perry, a senior project manager at Barclays Bank PLC in New York.

Biometrics, page 42

MIT mixes MBA, technology training

▸ *Students attend classes via videoconference*

By Nancy Dillon

EARNING A MASTER'S degree in business administration has always been a dream for Chris Mann. But Mann, an engineer at Ford Motor Co. in Dearborn, Mich., held back because he couldn't find a program with the right technical focus and was leery about putting his job on hold for two years.

That is, until last year when Ford picked Mann and 16 of his colleagues for a technical/business master's degree program at MIT in Cambridge, Mass.

The two-year program was designed for students to attend via videoconference. The MIT System Design and Management (SDM) Program comprises 13 required courses, and graduates receive a master of science in engineering and management from both the MIT School of Engineering and the MIT Sloan School of Management.

"SDM is teaching me how to manage project development so it's faster and cheaper"

"SDM is the best possible solution for me," Mann said. "It offers the core of an MBA tailored to engineering . . . and instruction takes place in our Dearborn training facility, so there isn't much interruption to my job."

The program does eat up the majority of Mann's free time, but he said the sacrifice is worth it. "I really believe that in today's business world, you've got to distinguish yourself somehow," he said. "And when I come off this program, I hope to move up into the leadership ranks at Ford."

MIT, page 42

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THe CIO IS iN THE hot seat as the executive committee drills one department head after another on escalating costs. How are you going to [1](get the newly acquired subsidiary onto our e-mail system)? How are you going to [2](hold down your network administration head count) as you add hundreds of new users? How can you afford to [3](roll out new apps to the whole company)? It's like the Spanish Inquisition, but the food is worse. Her stomach rumbles from the dry turkey sandwich and yuppie water served at the start of the meeting as one committee member wakes up long enough to ask about the [4](Year 2000 problem) he saw on a CNN segment. "Not a problem, we have it covered," she replies. With an unforeseen compliment for completing the [5](global supplier extranet) project, she is excused. Exiting, she smiles at the beleaguered marketing director, who is about to be skewered because the company's celebrity pitchman has just appeared on the cover of a major supermarket tabloid.

THE [6](BEST PARTS) OF HER MEETING WERE MADE POSSIBLE BY LOTUS.

[1]Lotus Domino™ and Messaging Migration Tools. [2]Lotus Domino systems administration tools. [3]Lotus eSuite DevPack™ Java™ applets. [4]Lotus Notes® and Domino are Year 2000–ready. [5]Lotus Domino Web Application Server. [6]www.lotus.com/workthewеb.

Lotus

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Citibank, Netscape pen E-commerce deal

By Tom Diederich

CITIBANK announced last week that it had signed a major licensing deal with Netscape Communications Corp. Netscape will provide software that Citibank will use for its electronic-commerce services.

Citibank will use Netscape's CommerceXpert suite of packaged Internet commerce applications and its line of server software.

The partnership will help Citibank, with offices in 100 countries and territories, offer the bank's products and services to corporate and consumer customers "through multiple touch points" that include desktop PCs, cellular telephones and customer-activated terminals, said Ed Horowitz, a Citibank executive vice president, in a teleconference.

"In essence, our goal is to be within one click, one call, one mile from our customers, no matter where they are around the world," he said. "In order to achieve this, we need to depend in large part on launching global electronic-commerce products and services."

Citibank currently offers home banking services on the Internet through its Direct Access product, but the deal with Netscape will let the company offer additional services, for both businesses and consumers, Citibank officials said.

Citibank officials declined to offer details on the service the bank plans but pointed to the functions of the software Citibank is licensing as an indication of its direction. For example, in Netscape's CommerceXpert line, ECXpert aims to automate corporate procurement, and PublishingXpert aims to automate customer service.

Citibank also will customize much of the software, company officials said. □

IDG News Service correspondent Rebecca Sykes contributed to this report.

Health care rules shift

CONTINUED FROM PAGE 39

are down to the wire and have to put new systems in place," said Rick Ratliss, vice president of information services at VHA, Inc. in Irving, Texas, an alliance of about 1,600 nonprofit health care organizations.

Ratliss said many of the organizations in VHA are now deciding whether they will try to make their own online transaction systems HIPAA-compliant or whether they will use a third party to process transactions.

Dr. Burton Kendall, chief technology officer at Lifemasters Supported Selfcare, an HMO in San Francisco, said, "In total, these rules will be fairly significant."

"There will be new patient identifiers, so that is the equivalent of the [year 2000] or euro," Kendall said. He pointed out that there is currently no standard way to identify patients.

At the same time, the standards will "open up a lot of new application areas," he said. "Most companies have electronic medical records, and they would like to interconnect hospitals and doctors, but they have been afraid of getting sued." Federal standards reduce that risk, Kendall said. □

Biometrics get you in

CONTINUED FROM PAGE 39

Bob Modell, manager of information technology at San Diego County's Department of Social Services, said biometric technology can yield much tighter security than guessable passwords. "Knowing that biometric technology is in use often deters would-be hackers and thieves from even attempting to penetrate a network," Modell said.

Right now, biometrics users are still few and far between, but they won't be for long, said Gary Lynch, an analyst at Gartner Group, Inc. in Stamford, Conn. "Biometrics is an under-$100 million market presently, but we're projecting it will grow by about 25% in the next two years," Lynch said.

San Diego County identifies its welfare clients at eight district offices using a face- and fingerprint-recognition system called Bioware from Unisys Corp. in Blue Bell, Pa. "Since implementing it, we've saved $110,000 in benefits fraud," Modell said.

The county chose biometric technology because "it's unobtrusive, affordable and ensures accurate identification," said Cecil Steppe, director of San Diego's Department of Social Services. The combination of Bioware, a new work-requirement program, and drug and alcohol testing have reduced the county's general relief caseload from 8,000 to 4,000 clients during the past two years, Modell said.

Mike Stinson, president and co-chief executive at Mr. Payroll in Fort Worth, Texas, said some biometric techniques are more acceptable than others.

There has been "a lot of consumer backlash" against fingerprinting and palmprinting, for example. "Biometric faceprinting is painless. The good guys don't care, and the bad guys run for cover," Stinson said. Mr. Payroll, a national check-cashing company, uses a face-recognition product from Miros, Inc. in Wellesley, Mass., to help identify customers at some cash machines.

SAVED $250 MILLION

Other early adopters include MasterCard International, Inc.'s office in Purchase, N.Y., which uses fingerprint readers to control access to the building. And New York's Welfare Services Department has implemented an embedded fingerprint card identification system, which saved the Big Apple $250 million in the past three years.

But except for a handful of cutting-edge companies in banking, finance and government, biometrics still seems arcane and Buck Rogersesque to many industries. But some still are checking it out, even if they aren't ready to jump onboard.

"We're not quite ready for it yet, but it could play a big role in helping us cut down on fraud," said Rochelle Hill, assistant vice president of information technology at Sotheby's, Inc. in New York. □

MOREONLINE

Links to biometric information can be found under "Biometrics Resources."
www.computerworld.com/more

MIT program mixes it up

CONTINUED FROM PAGE 39

MIT's SDM program has 93 students, 70 of whom are offsite. SDM classrooms use multipoint videoconferencing equipment from VideoServer, Inc. in Burlington Mass., to coordinate the video, audio and data exchange among the various distance-learning sites.

Off-site students use their own company's videoconferencing equipment, which must meet the International Telecommunications Union's H.320 videoconferencing interoperability standard.

MIT program administrator Margee Best estimated that the total cost to a company sponsoring one SDM student is $100,000 — half for the 24-month tuition and the other half for time, course materials, some required travel and hourly network charges.

Other universities that offer advanced business or technical courses through distance learning include Harvard University, also in Cambridge, Mass., and Carnegie Mellon in Pittsburgh.

Thomas Dannenhoffer, chief of low observables technology at Sikorsky Aircraft Corp. in Stratford, Conn., finds the hefty per-student expenditure easily justified.

"For anybody going through an executive program like this, I expect our investment to pay off," he said. Dannenhoffer manages several full-time engineers now enrolled in SDM.

Besides enriched technical skills, Dannenhoffer expects his engineers to gain business savvy from SDM. "The program doesn't just teach technology for technology's sake. It also teaches how to gain a competitive edge in the marketplace," he said.

To other managers with staffers beginning similar programs, Dannenhoffer offered the following advice: Take plenty of time to map out how to redistribute responsibilities to compensate for SDM class time and plan career goals for students. And get your employees powerful laptops so they can make up lost work hours either at home or on the road.

JUGGLING ACT

Jacqueline DiNuccio is an SDM student and a senior engineer who reports to Dannenhoffer. She spends about 32 hours per week designing stealth helicopters at Sikorsky and about 28 either in class or doing homework. She is also a wife and mother of two.

She calls the program a true test of time-management skills. "I'm juggling a job that I'm paid to do, several classes and a family. Sometimes one ball will slip, but it gets picked up quickly enough."

She said the payoff she expects from all of her juggling is a higher-level management job at Sikorsky. "SDM is teaching me how to manage project development so it's faster and cheaper," she said. "This is a skill any company needs to succeed in global markets." □

Snapshot

ETHICS AND TECHNOLOGY INDEX

Almost 45% of U.S. workers have engaged in unethical technology-related actions in the past year. Other findings:

- **Nearly 50% feel job pressure resulting from the use of high technology**
- **A majority feel that playing computer games during work hours and using E-mail for personal use isn't unethical**
- **Workers under 30 are less likely to consider actions related to office technology to be unethical than are older workers**
- **50% say they work with someone who is addicted to the Internet**

Base: Random survey of 1,000 businesses

Source: American Society of Chartered Life Underwriters and Chartered Financial Consultants, Bryn Mawr, Pa., Ethics Officer Association, Belmont, Mass.

Customer Relationship Management

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MCI

The Internet

Electronic Commerce • The World Wide Web • Intranets

Briefs

Worldwide 1997 online music sales

- **CDNow** *Revenue: $16.4M*
- **N2K (Music Blvd.)** *Revenue: $6M*
- **CUC (NetMarket)** *Revenue: $2M*
- **Others** *Revenue: $24.7M*

Source: Jupiter Communications, Inc., New York

Sales revenue up

Los Angeles-based Ticketmaster Group, Inc. sold $49.5 million worth of tickets online in the quarter ended April 30, up 170% from a year ago. The company said World Wide Web sales represent about 3% of total business.

E-commerce products

Sterling Commerce, Inc. has announced an enhanced suite of Internet-based electronic-commerce products. They include the Gateway Web suite for secure business-to-business commerce; Commerce Tracker for Web-based shipment tracking; Connect: Direct, Java-based software that extends data exchange to Web users within a company and to external trading partners; and ConnectAthlon, which lets users communicate with trading partners via the Internet.

Automated purchasing

Netscape Communications Corp. has announced its SuiteSpot 3.0 Internet software application, which automates corporate buying. Features include a unified view of multiple suppliers' catalogs and browser-based procurement capabilities.

Intranet helps in market shift

▸ *Web data mart expands bank investment service*

By Thomas Hoffman

JEFFERIES & CO. has rolled out a series of intranet-based data marts to help support the investment bank's expansion into new markets such as corporate finance and research. And it did so in less than four months and for less than $1 million.

"Everyone's goal is to set up a data warehouse in three months, show success and build off that," said Claudia Imhoff, president of Intelligent Solutions, Inc., a data management consultancy in Boulder, Colo.

FINANCIAL SERVICES

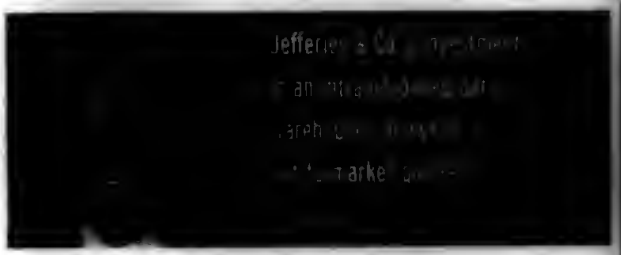
For Jefferies, the consolidation of data from nine different data fields into a unified view of customer accounts should go a long way toward fueling the company's shift to becoming a full investment bank, said Russell Lewis, senior vice president and chief information officer at the Los Angeles company.

The system, which pulls data from the legacy systems, scrubs it and plunks it into a Sybase repository, "allows us to get to market quicker, play catch-up and not have to retire legacy systems," Lewis said.

DIVERSIFIED SERVICES

Five years ago, Jefferies sold stocks. Period. Today, it provides corporate finance, research and a slew of other services to its institutional customers.

The data marts, which are broken down by business functions such as trading information and financial data, were developed using Ashburn, Va.-based Enterworks.com's Virtual DB system. The system lets Jefferies' 75 salespeople and executives determine, on a daily basis, "who our biggest customers were yesterday and whether we hit our [financial] targets," said Ajay Sareen, vice president of business planning and analysis and an end user who worked on the project steering committee.



Though Jefferies' World Wide Web-based approach lets users launch only "canned" queries and isn't as powerful as a traditional data warehouse, the company elected to take that approach because it could be rolled out quickly, Lewis said. Canned queries are prewritten questions; some software lets users ask their own questions.

Before the data marts were rolled out at the end of last year across a TCP/IP-based intranet, "it would have taken a month"

Data marts, page 46

• Federal government 'discovered the Internet' this season

'net bills are hot topic on the Hill

By Sharon Machlis

THERE HAS BEEN a flurry of government activity this month surrounding the Internet, as legislation on topics ranging from taxes to spam has started moving through Congress.

Critics, though, have questioned how quickly various proposals might turn into new policies and laws.

"This is the season when they've discovered the Internet," Andrew Sernovitz said of the federal government. He is president of the Association for Interactive Media, a Washington-based lobbying group. "There's all sorts of stuff brewing," he said.

For example:

■A revamped Internet Tax Freedom Act sailed through the House Commerce Committee earlier this month on a 41-0 vote, raising the hopes of some opponents of electronic-commerce taxes that the bill could be passed this year.

■Catching much of the industry by surprise, the U.S. Senate passed antispam legislation that requires unsolicited commercial E-mail to be labeled as an advertisement, use a correct return E-mail address, include accurate real-world contact information and honor requests to be removed from future unsolicited Internet mailings.

■Yet another encryption compromise effort was introduced in the Senate. It backs the right of Americans to use and sell encryption software without compelling them to give law-enforcement officials access to decoding keys.

The compromise also eases export restrictions and creates a research center to help govern-

'net issues, page 46

Internet Tax Freedom Act, latest House version

- Three-year moratorium on new Internet taxes, instead of six years
- Current state and local Internet taxes can be grandfathered
- Federal regulators can't set prices for Internet access
- Commission of 29 members will propose a way to impose unified, state sales taxes on electronic commerce

E-COMMERCE

Web group publishes draft of privacy spec

By Nancy Weil
BOSTON

THE WORLD WIDE WEB Consortium last week made public a draft specification for creating software applications that tell Internet users the privacy practices of Internet sites they visit.

Under the specification, users could configure their computers so that private information, such as credit-card numbers, is transmitted only when a site conforms with policy standards acceptable to that individual user.

CONFIGURATION

Computers can be configured to always deliver a prompt to let users know when a site asks for privacy information or to prompt them only if the requested information isn't what the users are willing to freely provide.

After receiving user feedback, the Web consortium will decide whether to approve the specification in the fall.

The specification has support from a range of companies, including America Online, Inc., AT&T Corp., IBM and Microsoft Corp.

The World Wide Web Consortium is an international group that develops common Internet protocols that involve interoperability and issues such as privacy. □

Weil writes for the IDG News Service in Boston.

'net issues are hot topic on Hill

CONTINUED FROM PAGE 45

ment deal with criminals who use encoded messages. But few expect quick agreement on this contentious issue.

■Vice President Al Gore called for a Summit on Privacy next month and announced a Federal Trade Commission World Wide Web site (*www.consumer.gov*) to help people protect the privacy of their personal information.

The latest version of the Internet Tax Freedom Act cut the proposed moratorium on Internet taxes from six years to three and also grandfathered some taxes now being levied by states and cities on various Internet activities.

The changes were aimed at winning key political backing from state and local leaders who earlier had balked at relinquishing potential taxing powers.

Rep. Christopher Cox (R-Calif.), who co-introduced the bill, says the full House could vote on the measure as early as next month.

But Sernovitz said that without the enthusiastic backing of Republican leaders there, it is "dead in the Senate for this session." Congress is expected to wrap up this year's session by Oct. 9.

But the Senate moved much quicker than expected in passing a bill covering spam; that bill now heads to the House.

Industry and consumer advocacy groups agreed with much of the bill, but some raised objections to a provision that would force spammers to label messages as advertisements.

"It's a very slow process when legislation is being driven by blue-ribbon panels and conferences."
– Scott Smith, Current Analysis, Inc.

Also, the Center for Democracy and Technology complained that the legislation "unconstitutionally restricts unsolicited anonymous political speech."

A Senate Commerce Committee hearing on spam is set for June 17.

On the privacy side, many who follow the issue believe the Washington summit will generate headlines but little new policy in the short run.

"It's a very slow process when legislation is being driven by blue-ribbon panels and conferences," said Scott Smith, an analyst at Current Analysis, Inc. in Sterling, Va. □

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Data marts speed bank's investment process, services

CONTINUED FROM PAGE 45

for Jefferies' information systems staff to generate a report for a financial consultant, so it did so only occasionally, Sareen said.

Now, the staff can use Netscape browsers to view summary-level reports and drill down on daily batch data housed in a Sybase data repository.

By year's end, Jefferies plans to upgrade the system to real-time updates using IBM's MQSeries middleware software, which will automatically move current data into the repository, Lewis said.

Lewis and Sareen said it is too early to measure the bottom-line impact that the data marts are having on Jefferies' business, apart from the ability to detect customer buying habits on a daily basis instead of monthly.

But Sareen said the project educated Jefferies' 150-person IS staff about the bank's businesses, which should "shorten the learning curve" on future projects, such as a project to be launched later this year that is aimed at measuring customer profitability. □

The Enterprise Network

LANs • WANs • Network Management

Briefs

Average base salaries for call center professionals in 1998

Inbound consumer director	$80,400
Inbound business-to-business director	$74,600
Inbound consumer manager	$56,300
Inbound business-to-business manager	$54,000

Base: Phone survey of 347 companies with internal or external telemarketing functions

Source: TeleManagement Search, New York

Bay router add-ons

Bay Networks, Inc. is prepping a series of enhancements to its high-end BackBone Node routers. Among them is a hardware compression add-on that will ship in the second quarter and cost $7,500, a $13,000 Gigabit Ethernet module and a $20,000 PowerPC-based processor. The Gigabit Ethernet module and the new processor will ship in the first quarter next year.

Network fault finder

AT&T Solutions in Florham Park, N.J., last week said it will offer a fault-prediction capability to its network management service. The software, from NetOps Corp. in Pleasantville, N.Y., checks thousands of status indicators across a network, analyzes the performance data, then E-mails the analysis to a network manager.

SHORING UP DEFENSE

The **Department of Defense** said it plans to spend nearly **$1 billion a year to improve security** for its **2 million computers**. The Defense Department's total IT budget for fiscal 1998 is almost **$10.4 billion.**

Web service might have eased security problem

By Bob Wallace

HAD IT BEEN established earlier, a World Wide Web-based customer service program from 3Com Corp. could have greatly simplified the process of notifying users when a wide-sweeping security problem arose recently.

COURTESY OF 3COM

Sumitomo's Rob McKenna: Web Service might have gotten word out quicker

On May 13, the Santa Clara, Calif., vendor announced its Subscription Web Service, which pushes new bug reports, release notes, support tips and more to the subscribing network manager's desktop.

The day after the announcement, before many users had a chance to sign up for the service, a security problem surfaced. Passwords that provide unauthorized access to most 3Com switches were posted on an Internet chat site, and the vendor had to scramble to alert thousands of users and inform them how to fix the problem.

3Com had to call and send E-mail to large users directly, while attempting to contact others through the company's worldwide distributor network.

Rob McKenna, president of the 3Com user group, received an E-mail first and then a call from the vendor about the switch security problem. He said a recent demonstration of the Subscription Web Service "looked very good and easy to use," but McKenna was waiting to see it in practice.

"The Web Service might have helped quite a bit with the security problem by getting the

3Com service, page 48

JOHN BLAIR

Power faults: Ghosts in the machine

▸ *Allstate office tracks server gremlins to unexpected source*

By Patrick Dryden

TWO YEARS AGO, the file server and the telephone system at Allstate Insurance Co.'s claim litigation office in Birmingham, Ala., began to shut down at random times for no apparent reason.

Support engineers, suspecting electrical problems, tried protecting the systems with an uninterruptible power supply and then by isolating the systems' electrical circuits from other devices in the office. Still, the systems would shut down almost on a daily basis.

Faulty ground wires are a problem many companies face

That meant serious downtime for users because it takes a long time to bring the servers back to life, said Paul Abrahamson, a regional facility engineering manager at Allstate in Northbrook, Ill.

"It cleared up for a while, then came back two weeks ago," Abrahamson said. "This has been such a nagging problem that we wonder if the place is haunted."

Despite Allstate's power-quality precautions, it turned out that electrical problems — faulty ground wires — were causing the mysterious and recurring glitches. And the same problem faces many other companies, even though an office may be wired to code.

In most buildings, improper grounding is the rule rather than the exception, according to power auditors. Electrical devices typically share grounding wires, which let them drain off dangerous power surges resulting from short circuits. When electrical current leaks to the ground wire or network cables link devices that

Ghosts, page 48

Client/server smoke detectors

▸ *Tools offer early slowdown warnings*

By Patrick Dryden

A HOST OF TOOLS that recently hit the market were designed to directly measure the performance of client/server applications from the user's point of view.

Each was designed to warn information systems managers about systems, network or application slowdowns at the desktop. That way, they don't have to rely on less accurate indicators such as estimated response times and irate user calls to the help desk.

But the products measure performance in two distinct ways, so users must be clear about what they want to accomplish before they pick a tool, analysts said.

Some tools monitor user transactions. Others generate artificial transactions, stopping short of actually updating data (see chart, page 48).

"All have their pros and cons, but the main idea is to find out about slowdowns before users do," said Herb VanHook, an analyst at Meta Group, Inc. in Stamford, Conn.

EARLY WARNING

"For the first time, we're able to specifically document transaction times for cross-platform financial applications," said Keith Smeby, a technical services manager at 3M in St. Paul, Minn. Using information on transaction performance from Candle Corp.'s ETEWatch monitor, "we get an early warning when transactions approach unacceptable limits, and users can understand what we're watching."

Another tool, VeriServ from

Smoke detectors, page 48

3Com Web service

CONTINUED FROM PAGE 47

word out quicker," said McKenna, vice president of global engineering at Sumitomo Bank Capital Markets, Inc. in New York.

With Subscription Web Service, network managers select up to four types of information they want to receive. They then download a software application, which generates an icon on their screens. The icon glows when new information has been received.

"This could be faster than an E-mail and could save me from frequently querying the 3Com Web site," said Orin Beebe, information systems technical manager at Business Records Corp. in Santa Clara, Calif. "This would be an advantage to my engineers, who could be notified of a problem before they realized they had one. Time is of the essence with things like security problems."

Beebe said he would like to see 3Com use push technology to deliver upgrades to the vendor's networking products.

"This would eliminate the need for a technician to visit every desktop, which would reduce maintenance costs," he said. "It could let me upgrade [adapter cards] in hundreds of workstations at the same time."

Cisco Systems, Inc. uses push technology much like 3Com does with Subscription Web Service. Cabletron Systems, Inc. and Bay Networks, Inc. don't use push technology with their Web-based customer services.

MORE EFFICIENT

3Com also announced Case Tracker Web Service, which lets network managers monitor the progress of their technical support cases online. They can review all cases — all open, all closed or all closed since a given date. Bay announced a similar service last week. "This could save me many calls to 3Com to check the status of cases," McKenna said.

Both services are available now and are free worldwide under Guardian, Express and Premier service contracts. □

Ghosts in the machine

CONTINUED FROM PAGE 47

have different ground points, sensitive computers can get confused and act possessed.

After replacing internal power supplies and other parts, Allstate's information systems people decided the building itself was the culprit. Contractors and the local utility monitored power but couldn't find a cause, Abrahamson said.

Finally, a team of ghostbusters from American Power Conversion Corp. (APC) scrutinized the site. They found an exposed wire in Allstate's office and detected a short circuit in a neighboring tenant's office. Both sources intermittently dumped current to the ground wire that the offices shared, disrupting the Allstate server and phone system.

"We've found current on the ground at two out of five sites we've audited in the past year, even in new sites where everything is done correctly according to wiring codes," said George Kouba, also a facility engineering manager at Allstate.

Every one of more than 300 sites audited by APC in the past three years had some violation of national electrical codes, with 90% of those related to grounding, according to Tony Despirito, manager of the field survey program at APC in West Kingston, R.I.

CODE CONFLICT

Two major national codes and many local codes conflict in their definition of proper grounding, Despirito said, so even new buildings may wind up with a "dirty" ground or too many grounding points.

Resulting problems may include "phantom reboots," data loss or corruption, frozen keyboards and damage to communications ports and network interface cards.

Exorcising such grounding gremlins requires lots of costly effort. Power specialists can find and remove the cause of current on a common ground. Electricians may have to remove conflicting ground connections or provide circuits that support computers with their own isolated ground wire.

Disruptions at the haunted Allstate office continue infrequently, Abrahamsoo said. But with only a dozen employees there, spending money to fix the landlord's problem doesn't make sense, he said. "Now it's a lease issue." □

SHORTS

Service pack

Novell, Inc. in mid-June will release Service Pack 6 for IntranetWare 4.x. It will feature upgraded memory allocation resources that improve network throughput and some of the enhancements Novell will include as standard features in NetWare 5.x, due this summer, a company spokesman said. The service pack will be available for downloading at *www.novell.com*.

Service pact

Microsoft Corp. and Hewlett-Packard Co. last week said they will work together to deliver services to big companies that deploy Microsoft's Exchange messaging system. Microsoft has a similar arrangement with Digital Equipment Corp. in Maynard, Mass.

Smoke detectors

CONTINUED FROM PAGE 47

Response Networks, Inc., can help IS maintain service levels by tracking the whole path of a transaction, said Valerie O'Connell, an analyst at Aberdeen Group, Inc. in Boston. VeriServ launches transactions on a schedule to measure the time it takes for servers, databases and network links to respond, she said.

Artificial transactions are predictable and run independent of user activity, so IS and users can agree on what is being measured, said Sue Aldrich, an analyst at Patricia Seybold Group in Boston. "But that information doesn't tell you what actually happens to users," she added.

FirstSense Enterprise, from FirstSense Software, Inc., aims to fill that gap by examining specific SQL exchanges between working users and distant databases to measure the actual response times they experience, Aldrich said.

Even better, Aldrich said, when FirstSense notices response times lengthen, it can automatically capture current performance statistics from systems and networks involved. That makes on-the-spot diagnosis faster and simplifies a performance autopsy later.

Being able to control what you monitor and when is essential to establishing a performance baseline, said Brett Burley, a telecommunications engineer at San Diego-based integrator Science Applications International Corp.

But Smeby said the objective is to track real service, not dummy transactions.

"There's a huge difference between measuring generalized performance and knowing that certain types of transactions always have slow response," he said.

The perspective provided by a tool that reports actual user activity sounds better "because I have to deal with the person on the other end of the phone," said David Desnoyers, an IS analyst at Bay Networks, Inc. in Santa Clara, Calif. "Now I can capture and troubleshoot their experience, not a simulation." □

EARLY-WARNING AGENTS

Agent software running in clients can directly measure application performance to servers and back, and then report to a console. This user perspective can alert IS about slowdowns. The tools take two approaches:

Watchers

Agents that monitor the actual response time experienced by a user

Vendor	Product	Availability
Candle Corp. Santa Monica, Calif.	ETEWatch	Now
FirstSense Software, Inc. Burlington, Mass.	FirstSense Enterprise	Next month
Landmark Systems Corp. Vienna, Va.	SmartWatch	Now
VitalSigns Software, Inc. Santa Clara, Calif.	VitalAnalysis	Now

Actors

Agents that simulate user activity to measure response time

Vendor	Product	Availability
Ganymede Software, Inc. Morrisville, N.C.	Pegasus	Now
Luminate Software Corp. Redwood City, Calif.	Luminate for SAP R/3	Now
Network Tools, Inc. San Jose, Calif.	Chisel	Now
NextPoint Networks, Inc. Westford, Mass.	NextPoint S3 Harmony	Next month
Response Networks, Inc. Alexandria, Va.	VeriServ	Next month

Software

Briefs

Sum deal finalized

The Sum Co. has completed its acquisition of U.K.-based financial applications vendor Coda Group PLC in a stock deal valued at $83 million. Coda's software is being folded into a new business unit based at Sum's U.S. headquarters in Reston, Va.

SAP targets banks

SAP America, Inc. has introduced an application suite called SAP Banking aimed at helping banks and other financial services firms understand customer profitability and market risk across product lines. SAP has 400 financial services customers, including Deutsche Bank AG, First Chicago NBD and Barclays PLC, that use its core financial software.

Making market

The number of packaged application bundles aimed at middle-complexity buyers is expanding. Lawson Software in Minneapolis last week announced a partnership that ups that candidate's software with Oracle Corp.'s Oracle8 database and Windows NT-based servers from Hewlett-Packard Co. Prices start at $100,000.

SSA revamps Unix apps

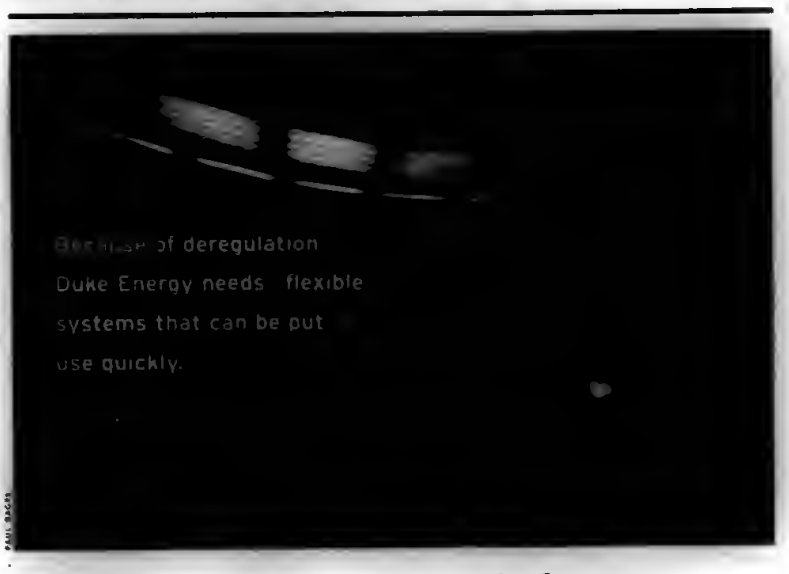
System Software Associates, Inc. (SSA) is beta-testing a revamped Unix version of its packaged applications, which it plans to ship in August. Chicago-based SSA said the Unix software's code generator is being rewritten to eliminate the performance bottlenecks that kept it from running large applications.

Java data analysis

Arbor Software, Inc. in Sunnyvale, Calif., and neighboring Alphablox Corp. in Mountain View, Calif., together will develop Java-based analytical applications. Alphablox and Arbor are slated to integrate Alphablox's flagship Alphablox Blueprints, a tool for building Java applications, with Arbor's Essbase online analytical processing product.

YEAR 2000

Power plant panic?



PAUL BACA

By Matt Hamblen

WHEN IT COMES to year 2000 readiness at utility companies, power customers and government regulators say they are somewhat left in the dark.

Dozens of energy providers say they are cooperating with one another on fixing software so it recognizes the year 2000 and 00 keeping customers informed. But they are in the minority of the nearly 8,000 companies that provide and distribute power nationwide, according to testimony by an analyst and regulators at a recent congressional hearing.

Lawmakers concluded the power industry won't be 100% ready by 2000 and urged utilities to inform their customers about what is being done. Failure to fix the software could force some nuclear plants to shut down before Jan. 1, 2000, and could have un-

Power plant panic? page 51

UTILITY INDUSTRY

Utilities unify – on mainframes

By Craig Stedman

EXPANSION MADE possible by deregulation is pushing Duke Energy Corp. to power up new packaged applications for finance and human resources. But Duke isn't pulling the plug on the systems it knows best: mainframes.

The Charlotte, N.C.-based utility is putting PeopleSoft, Inc.'s applications on the familiar turf of mainframes with DBa databases instead of taking the more conventional Unix or Windows NT path.

"We just don't have the luxury of time now to develop big customized applications" for basic corporate functions such as finance and human resources, said Cecil O. Smith Jr., Duke's chief information officer. "But one of the things I liked about [the mainframe] was that it's a known world."

Mainframes are still the processing workhorses at both divisions of Duke Energy, which was formed last year when regional electric utility Duke Power Co. bought PanEnergy Corp., a Houston company that transmits natural gas in 20 states. But their mainframe applications were highly incompatible, Smith said.

To unify the companies, PeopleSoft's human resources software was installed at Duke Power in December. It is due to go live at PanEnergy later this year. The rollout plan was reversed for PeopleSoft financials: PanEnergy got the software in April, and Duke Power will follow by year's end.

Staying with the mainframe

Utilities, page 50

Stand-alone HR module lets users pick what they need

By Randy Weston

USERS INTERESTED in human resources functions in SAP AG's R/3 00 longer have to buy the farm to get the cow.

The human resources application in R/3 4.0 (see chart), to be released later this year, will be the first module in R/3 to be sold as a stand-alone product.

SAP, in Wayne, Pa., is in the midst of breaking up its highly integrated flagship business automation software into stand-alone modules. Human resources is the first core module to be severed; financials and logistics are to remain bound together until R/3 Release 5.0.

The independent human resources module means users won't have to install the entire R/3 system and can turn on only what they need. Although the exact cost isn't known yet, analysts said separate modules should save users time, money and the headaches of implementing the entire R/3 product or upgrading the entire suite to get a single bit of new functionality.

"We have been salivating for this," said Gary Banks, director of the center of technical excellence at St. Louis-based chemical company Monsanto Corp.

Stand-alone HR module, page 50

Some of the new functions in SAP HR 4.0

Function	Purpose
Organizational management	Tracks organizational chart, including employees who report to more than one department
Personnel cost planning	Forecasts labor costs, wages and salaries
Personnel management	Maintains database of employee qualifications and proficiencies
Recruitment	Tracks and posts open positions and allows managers to track potential candidates for job openings
Manager's desktop	Lets managers perform human resources tasks and forward them for processing, as well as access employee information for planning

Stand-alone HR package

CONTINUED FROM PAGE 49

"This is exactly the architecture we want."

Banks said Monsanto is evaluating whether to move to the SAP human resources application from a customized PeopleSoft, Inc. human resources application. The fact that the SAP application is a stand-alone product and still can be integrated with the rest of the R/3 package is attractive, he said.

He said with the current tightly integrated R/3 system, tasks such as database recovery and upgrades are arduous because the entire package needs to be recovered or upgraded, rather than just the piece that needs to be.

"It would be nice [that] if something went wrong, we didn't have to recover the whole world," Banks said.

But analysts warn that the breaking up of R/3 comes at a price: losing some of the tight integration that users flocked to R/3 for in the first place.

"It's never going to be as tight as if the module is part of one monolithic system," said Joshua Greenbaum, an analyst at Hurwitz Group, Inc. in Framingham, Mass. "But that's the price to pay in terms of throughput and complexity. But it is relatively seamless. If you hook the HR application up to other parts of R/3, it's going to be a nice neat job."

Greenbaum also warned that users had better be sure the human resources module has all they need before they buy it because some human resources functions — payroll, for instance — require other parts of the SAP system, such as the financial module.

For example, the state of Florida is preparing to implement SAP's HR Release 4.0. It also had to buy the financials application because some financials functionality is required for payroll, said Linda Fuchs, human resources and payroll project coordinator for the state. Those include accounts payable and receivable to handle items such as wage garnishments for child support or payments to the federal government.

"We told SAP what we needed, so on the CD they sent, we are getting financials even though we have no intention of turning on [the] general ledger [part of the software]," Fuchs said.

But the state may do just that eventually. Florida is evaluating a financial package, and Fuchs said SAP obviously will be a front-runner because it already is partially installed. □

MOREONLINE

See @Computerworld for links related to SAP under "SAP resources."
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Utilities unify – on mainframes

CONTINUED FROM PAGE 49

hasn't all been a piece of cake, said Bob Matsey, manager of data delivery at Duke Energy. For example, the company found it had to add a series of custom data indexes to DB2 to speed up batch processing on both the human resources and financial applications.

But PeopleSoft will bridge a wide gap between the financial systems of Duke Power and PanEnergy. Getting their homegrown balance sheets in sync "was a nightmare," Matsey said. "We had to do a lot of monkeying with the code to get the numbers to mesh."

And Duke expects to cut its human resources costs up to 20%, in part by letting all workers use its intranet to sign up for benefits and to update the personal information in their files, said Wayne Gartner, PeopleSoft project director in the human resources department.

"We looked at other companies that were ahead of us [in human resources], and having employees look after their own data was a big hit," Gartner said. Earlier this month, users made about 2,000 changes to their records the first week PeopleSoft's self-service capability was turned on, he added.

Jim Holincheck, an analyst at Giga Information Group in Cambridge, Mass., said users who run packaged applications on mainframes are still a select group. But for industries such as financial services and utilities that continue to rely heavily on big iron, the power and stability of mainframes are strong lures, he said.

Duke tried before to move a big corporate application off the mainframe, without success. In 1995, when it was still Duke Power, it scrapped an object-based rewrite of its customer information system after consultants from Oracle Corp. fell far behind schedule on the $23 million project. □

HEWLETT PACKARD
Expanding Possibilities

Microsoft

Power plant panic in 2000?

CONTINUED FROM PAGE 49

known consequences for electricity availability nationwide [CW, May 19]. Customers say they aren't getting the guarantees of power they would like.

"Utilities are so far unwilling to share the results of their [year 2000] tests," said Cathy Hotka, vice president of information technology at the National Retail Federation. "One company is unwilling to rat on the other, and they seem to think they'll have legal trouble if they do. . . . Our members don't know if they're going to have power or a [telephone] dial tone come Jan. 1, 2000."

"The time for [year 2000] awareness is over. It's time for some action"

"The time for awareness is absolutely over. It's time for some action," said U.S. Rep. Constance Morella (R-Md.), chairwoman of the subcommittee that held the hearing. Her subcommittee has met several times to discuss the preparations and raise corporate and public awareness, but it doesn't plan to introduce legislation. Aides said there is simply too little time to do so, and some regulators said they don't want to burden private companies with administrative details when they could focus on fixing the problem.

"It's difficult to maintain a sense of optimism that the energy utility industry is using the concept of 'shared experience' to expedite total industry Y2K remediation efforts," analyst Richard Cowles testified before the U.S. House Science Committee's Subcommittee on Technology. "The Y2K problem is being viewed as a competitive issue, which is clearly an impediment to the free and open exchange of information."

Cowles said that with so many utilities openly competing to sell power, more have been backing off from saying they are ready. And none is willing to admit it might not be ready.

Power companies that are concerned about being sued for not doing enough also have clammed up, Cowles and federal regulators said. "The liability issue is diminishing the information that's available" for sharing, said Kathleen M. Hirning, chief information officer at the Federal Energy Regulatory Commission (FERC) in Washington

REGULATORY GAPS

Gaps in the regulatory blanket also seem to be diminishing the government's ability to oversee the readiness of utilities.

Hirning said FERC's regulatory powers are limited, especially regarding the reliability of power grids. She said the 50 states hold more regulatory control over energy utilities, but John L. Laakso, executive director of the Texas Public Utilities Commission, worried that the states don't have enough power because they can't control interstate commerce, including distribution across state lines.

Among the power providers willing to talk is Potomac Electric Power Co. (Pepco) in Washington, which testified it is willing to share information to help other utilities reach the deadline. "I think Pepco is in pretty good shape," testified Pepco's Kenneth P. Cohn, manager of computer services. "We believe we'll be there" by Jan. 1, 2000.□

Senior editor Thomas Hoffman contributed to this story.

NEW PRODUCTS

MICROSOFT CORP. has announced Liquid Motion 1.0, an animation tool for browser-independent Web publishing. According to the Redmond, Wash., company, the WYSIWYG tool has the same user interface as Microsoft's FrontPage World Wide Web design application. It has a library of two- and three-dimensional Web-ready clip art and built-in special effects such as smoke and bubbles.

Liquid Motion 1.0 costs $149.

Microsoft
(425) 882-8080
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SOFTWARE PURSUITS, INC. has announced SureSync 2.0, Windows server software for backup, disaster recovery, software distribution and server mirroring. The Alameda, Calif., company said the software lets files be synchronized or replicated between servers over a LAN/WAN. The server license costs $995 for the first two servers and then $500 each.

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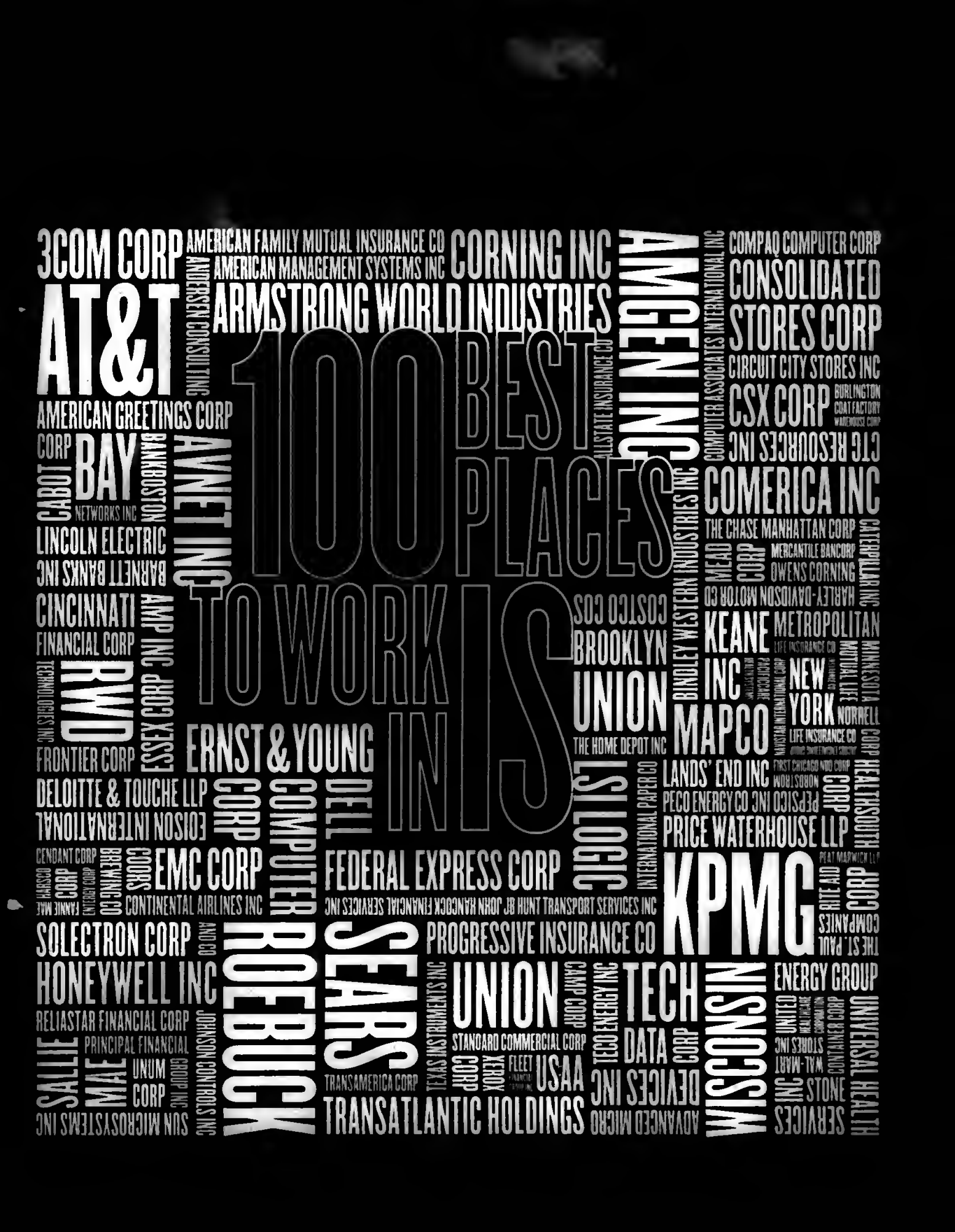
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From the Editors

A SIGN OF THE TIMES

Not a day passes when we do not receive one or more calls from HR, IS or PR managers breathlessly asking how their organizations can qualify to be among Computerworld's 100 Best Places To Work in IS.

The answer is this: You have to be a Fortune 1,000 company or a major IT consultancy to be considered. You then have to pass our rigorous standards (see methodology, page S19).

Finding, attracting and retaining the best talent is the No. 1 corporate imperative these days, particularly for the growing number of organizations whose livelihoods pivot around information technology. And competition is nothing less than fierce.

The Best Places road starts with organizations that build work environments that provide stimulating career challenges and encourage grassroots innovation. It's the organizations factoring their employees' home lives and cultural makeup into corporate policy that are making headway. Competitive salaries and humanistic benefits still need to be compelling, true. But advanced training programs and flexible work schedules are vital to building and retaining top-notch IS staffs.

Sounds like a Disney fantasy. But many Best Places companies are hitting these workplace high notes. Take Sears, which encourages IS employees to occasionally turn off their terminals and visit local stores and credit centers or make service calls (page S8).

This year, we split our respondents into two listings: IT and non-IT companies. We did this to account for IT companies' greater financial leverage, technology affinity and willingness to fund cutting-edge training programs out of competitive necessity.

We also added an additional check and balance this year: asking rank and file IS employees at Best Places companies to substantiate their managers' survey responses. One look at the profiles herein and on our Web site (www.computerworld.com/BestPlaces98) and you'll see why these companies are the best of the best. So in the spirit of continuous improvement, we beckon you inside and encourage you to E-mail your feedback to us at best_places@cw.com.

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COVER DESIGN BY JOHN BAXTER

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100 BEST PLACES TO WORK IN IS

As competition for IT talent reaches Indy 500 levels, it's the employees who are now in the driver's seat while their employers work overtime to keep them from leaving. Gone are the days when layoffs threatened information systems professionals, especially at companies on the Best Places to Work in IS list. Demand far exceeds supply for the right information technology talent.

So it's no secret that with industrywide turnover rates between 11% and 20%, according to Meta Group, Inc., the No. 1 concern among today's IS organizations is retention. And that means time-tested tactics are no longer sufficient. Nearly every company we surveyed this year said it is offering its IS people more money, additional training and, in some cases, better benefits to fend off the headhunters. It is just the degree that varies.

Virtually all of the 100 Best Places have managed to keep their employees on board at a better rate than the industry as a whole. On average, the Top 25 computer-related companies and consulting firms lost only 11% of IS staffers in 1996, while the Top 75 companies in non-IT-related

industries lost a mere 7.5%. Even more impressive, 23 companies reported a turnover rate of 4% or less.

One of the top criteria for retaining IS employees is training. This year's 100 Best Places spend an average of $4,500 per IT staffer per year on training. And some companies, including Owens Corning, are even allowing employees to access training on demand over a corporate network.

For Owens Corning, training is among the Top 4 items that keep people from leaving the IS organization, says David Johns, managing director of IS. Besides courses in project management, SAP AG technology, Unix-based technology and PeopleSoft, Inc., "we get [IS people] out to the business units as much as we can so they learn what happens in the plant or what happens in customer fulfillment and logistics," Johns says. "And we have several leadership-type training programs that we put people through as well."

Of course, Johns acknowledges, "that does not mean there won't be people who say, 'Thanks for the training — I'm leaving because I want to double my salary.' "

Money, indeed. Regardless of what IS professionals tell pollsters, the reason they leave an organization is usually tied to compensation, says Kerriann Vogel, senior research analyst in Meta Group's Reston, Va., office. "They'll say they didn't like the culture, that the job wasn't challenging enough or that they want more responsibility," she says. "But when you talk to them one on one, the bottom line always is money."

And that's apparently not news to many of the companies on this year's Best Places to Work list. More than one third said they expect to increase total IS compensation by more than 10%. The raises were even more substantial among high-tech companies and consulting firms, more than half of which said they plan on

increasing compensation by more than 10%.

But as a sign of the times, many of this year's Best Places went a step further. More than 75% said they are rewarding IS people with performance bonuses for a job well done.

Take Universal Health Services, Inc. From Day 1, the King of Prussia, Pa.-based company has offered bonuses for senior executives, according to Chief Information Officer Linda Reino. In the past two or three years it has begun awarding these bonuses to people at the manager or employee level. "I have no doubt that it makes a difference," Reino says, "when they realize that the company cares — that I care."

At CSX Corp., employees see bonuses as "as a significant part of their compensation," says John Andrews, CIO. Andrews says he expects bonuses in 1998 to be awarded to 90% of the company's technology division.

These companies are making a good choice, Vogel says. "Bonuses have a lot to do with retention, particularly if you structure them so there are payoffs more than once a year."

And yet the Top 5 IT and non-IT Best Places to Work aren't content to stop with quantifiable benefits. They offer an advantage that can be summed up in a word: opportunity — the opportunity to work with leading-edge technologies, the opportunity for IS staffers to voice their opinions and know they'll be heard and the opportunity to chart their own careers through a variety of divisions.

At Sears, Roebuck and Co., No. 2 on the non-IT company list, "the environment is extremely diverse," says Bernie Bartelli, vice president of retail IS for full-line stores. People can choose from functions and departments that range from full-line department stores to specialty stores to automotive to credit to home services to direct marketing.

The same degree of flexibility goes for Computer Associates International, Inc. At CA, employees can take new jobs every few years. Technical writers routinely become programmers and project leaders. Likewise, at Cincinnati Financial Corp., employees who begin in clerical positions frequently become members of the IT team.

All of these attributes help make a company a Best Place to work. However, none of them alone can put a company on the list. A Best Places company requires the right combination of benefits, training, IT management and overall business savvy. None of these companies are perfect, but they're certainly on their way. The profiles that follow are just a sample of what it takes to make the grade.

A TRUE PARTNERSHIP: IS STAFF IS ITS MAJOR CUSTOMER

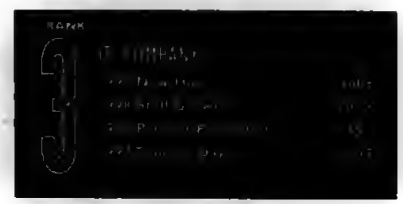
BY ALICE LAPLANTE

Tom Thomas has a busy day ahead. It's his first day back from vacation, and in addition to meeting with a reporter and catching up on accumulated E-mail and voice mail, he's got two presentations to make to 3Com Corp.'s corporate customers.

That's right, fellow CIOs looking to buy and deploy 3Com Corp. products. So with a cup of fresh espresso in hand — among other employee perks, 3Com managed to entice Starbucks to open a trendy full-service coffeehouse in the middle of campus — Thomas strides along gleaming marble walkways past palm trees still dripping from the latest El Nino downpour to get to 3Com's plush customer briefing center.

Located within yelping distance of the Great America roller coaster in the heart of Silicon Valley, the 3Com campus continues to spread as the company's fortunes continue to rise. (After its merger with U.S. Robotics, Inc., completed in the 1997 fiscal year, 3Com racked up an impressive $5.6 billion in revenue selling global networking products ranging from modems to enterprise backbone solutions.) In addition to Starbucks, the too-clean-to-be-real employee cafeteria, the elegant sit-down dining room and the state-of-the-art fitness center, the company has established a place where customers can come to see real-time global networking in action. This isn't a demonstration — it's a walk into the very heart of 3Com's own 24-by-7 worldwide network operations.

"We didn't want a canned demo. We wanted our customers to see the real thing," says Thomas, who, yes, is thus an active participant in the 3Com enterprise sales cycle. He estimates he spends at least 30% of his time this way, dispensing free network consulting wisdom to any corporate customer wanting to take advantage of it. And it only makes sense, Thomas argues. "We're one of our own largest customers. If a potential customer wants to see how our



products work in the field or how to deploy SAP over a global WAN, we're happy to show them."

You can't get more involved in the business than that.

It's commonly claimed, but at 3Com, information technology is genuinely part of the business.

Just listen to Marianne Cohn laud the technology infrastructure at 3Com, without which she could not manage her globally dispersed team. As director of Internet marketing, Cohn oversees a department that does everything from building Web applications to developing systems and tools to manage Web sites to training employees in Web development and publishing techniques. She also manages a Web content team, which is a group of editors responsible for pulling content together and forming a cohesive and consistent story.

Surprisingly, one of the managers on Cohn's staff lives in Phoenix. "This is a very talented individual whose spouse was relocated, and we didn't want to lose her," Cohn says. The remote network access capabilities put in place by Thomas' team means this person can manage employees from Santa Clara, Calif., to Chicago and do everything she could do onsite in Santa Clara.

Cohn, a nine-year 3Com veteran, says that without the infrastructure Thomas has put into place, she would not be able to hold her current position. One of her small children has a medical condition that requires flexibility on her part. The fact that she can access the corporate LAN from home or a doctor's office makes an otherwise impossible job situation possible.

DRAWN BY POSSIBILITIES

Thomas was wooed away from the chief information officer position at Dell Computer Corp. three years ago by 3Com chairman Eric Benhamou, who wanted to transform his own IT operation from a back-end support function into one that would participate fully in all aspects of 3Com's business.

Thomas says now he had two reasons for joining 3Com: He saw a company where information sys-

tems had previously been excluded from key decisions and a chief executive officer ready m change that. And he also wanted a chance to jump inm the fast-growing networking business. "It was a chance to work with a tecognized management team in a very strong industry," he says.

Thomas brought in a new senior management team, reorganized the departmenr along the lines of a decentralized "matrix" philosophy and put into place strategic goals still in the process of being achieved.

ENTHUSIASTIC EMPLOYEES

Thomas' employees are excited m be on the leading edge of technology.

Jerry Kenao is vice prosideot of geographic IS computing and network services, which means he is in charge of the massive infrastructure that supports 3Com's 17,000-strong workforce. He is responsible for operating systems ranging from MVS to Unix to Windows NT on platforms ranging from mainframes to Sun Microsystems, Inc. workstations to Iotel Corp. PCs. One of the exciting projects he and his staff are currently working on is reaching as many of the company's 13,000 employees as possible in real time when oecessary, specifically by broadcasting interactive video to the desktop across the local- and wide-area network.

"I doo't have to spend an inordinate amount of time tryiog to justify the use of technology to drive productivity. In a typical company, my peers envy the position I'm io: We have engineers as users, a chairman who is extremely technically knowledgeable and visionary, and you don't have to spend a lot of time convincing people of the value of what you are doing."

The opportunities at 3Com are so exciting — and, not incidentally, the trust in management so deep — that Adam Wasylyshyn, an IT manager on the fast track up the organizational ladder in 3Com's Boxboro, Mass., office, took a leap of faith and left his job on the East Coast managing the computing and network services center for the region to spearhead a three-month project rolling out SAP AG's R/3.m 3Com sites worldwide.

"Tom Thomas offered me the opportuoity, and I jumped on it," he says. Now he's back in the Boston area with a good deal more responsibility than he had. "They reward you for taking risks and for doing a good job," Wasylyshyn says.

And take Scott Baker, who until recently was one of Thomas' Top 3 "czars," in charge of strategic planning — an important and highly visible position. At his own request, Baker has moved into a lower-level (but equally important) tactical position. Now director of Web services, he is in charge of 3Com's intranet. "He wanted to be on the front line building systems," Thomas says.

The fact that Baket felt comfortable asking for and taking what was in effect an organizational step down (although he retains a director-level ranking) says volumes about the culture, loyalty and enthusiasm Thomas has managed to foster. And wbat does Thomas say about having m replace a key management position? "I was delighted. A very valuable person remained with the company. We haven't lost that knowledge and skill set, and I now have an opportunity to bring a new person up to speed," he says.

GARY LAUFMAN

PASSION FOR IS

Madeleine Fackler came on board just six months ago, after 17 years at Hewlett-Packard Co. As vice president for worldwide business applications, Fackler is responsible for the worldwide applications set 3Com deploys. Making the move from HP was a "really big deal" for her, she says. What ultimately drew her to 3Com was that "they really have a passion for IS," she says. "Over the course of my career, I've talked to a large number of IT managers. All too often, they're the orphans. They don't get much respect." That was clearly not the case at 3Com, she says.

Which isn't to say the pace isn't grueling.

This particular morning, Fackler was awakened at 5 a.m. by an urgent overseas call. "The rule here is that we VPs get to sleep in until 5," she says. "The phone usually rings oo the hour." This is fairly typical — on most days, Fackler is roused by an early call or page. While booting up her home computer she makes her first cup of coffee, then checks her electronic mail (she gets about 70 messages a day that need to be personally responded to). Then it's off to the 3Com gym for her daily workout between 6 a.m. and 7 a.m., "which keeps me sane," she says.

She's usually in her Santa Clara office by 7 a.m. "I pretty much know from home if there's any critical issues I need to take care of immediately," she says. She then puts in a full day of meetings, both local and virtual, with her worldwide management team. Although she usually makes it home by 6:30 p.m. for a few key hours of family time, it's also not uncommon for her to log on for another couple of hours at 9:30 or 10 p.m.

Why work this hard? "I saw a chance at 3Com m do something I hadn't seen before," she says, "and that's move IS m the next level."

With pristine academic credentials — a bachelor's degree in math and economics from Smith College and a master's degree in computer science from Stanford University — and a work history that includes time spent in senior research and development, product development and manufacturing positions, Fackler could pretty much write her ticket in any high-tech job at any company. Yet she chose IT, and she chose 3Com.

"To me, this is the perfect job. It's the perfect combinatioo of creative, technical, tactical and strategic, and you know every day how you're affecting the business."

LAPLANTE IS A FREELANCE WRITER BASED IN WOODSIDE, CALIF

THE NEW IT: NOT JUST LIP SERVICE

By Jennifer Schnidt

The sound of a CIO boasting about how closely his IS organization is aligned with the business is an all-too-common refrain.

So when Joseph Smialowski, senior vice president and chief information officer of Sears, Roebuck and Co., says with quiet authority, "We do not have end users; we have business partners," you might dismiss his comments as another example of overly optimistic management-speak.

But to do so in the case of Sears would be to overlook a major success story. During the past five years, Smialowski, a low-key leader with a clear agenda, has indeed transformed the 1,500-member information systems team at the nation's No. 2 retailer from a group perceived as little more than a support organization to one so tightly coupled with the business units that the business partners frequently forget they are part of a separate organization. And in doing so, the 49-year-old former Price Waterhouse retail analyst has proved an instrumental player in the company's five-year return to profitability. He has also created an organization deemed this year's No. 2 Best Places to Work outside of the information technology space.

Smialowski based the metamorphosis on a business philosophy called the "employee/customer profit model," the core element to a companywide turnaround strategy masterminded by Chief Executive Officer Arthur Martinez. According to this model, if Sears becomes a more compelling place to work, it will become a more compelling place to shop and ultimately a more compelling place in which to invest.

INNOVATIVE ANSWERS

Using this concept as his guide, Smialowski introduced new management techniques designed to bring his employees closer to the front line so they have a clearer view of their business impact. He encouraged IS professionals to occasionally break away from their monitors and meeting rooms and learn more about the business by visiting local stores and credit centers or accompanying service people on home service calls. He guarantees every IS employee 10 days of training from Sears' extensive training curriculum. And he began a strategy to take the company from a ratio of four consultants to every six IS employees to a ratio of one to 10 to foster continuity in the business partner relationship.

He also made sure IS people were working literally side by side with their business partners in the retail, home services, credit, telemarketing and commercial brands business units. Today the IS organization is spread throughout Sears' 1.9-million-sq.-ft. sprawling glass headquarters, connected by skyways.

The strategy seems to be working. IS professionals such as Mike Kniola a systems manager in credit systems who has been at the company for 26 years, says "our current work environment is the best it has ever been."

Pat Welter, a program manager who has worked on several retail systems, elaborates. "Working closely with the business has given me a better understanding of the many challenges they have," he says. He believes, in turn, that his business partners are able to better understand his role.

As was the intention, this improved level of understanding extends beyond feel-good sentiments and spills over into systems that make an observable difference to customers. One, called the enhanced home delivery system, uses complex algorithms to calculate routes and delivery times, automating what was once a manual process. The system, which was awarded the Retail Innovation Technology Award, offers Sears two distinct advantages: It enables the scheduling process to be completed in 20 minutes instead of three hours. And it allows Sears to make good on its promise to deliver, say, a washer, within a two- or four-hour window nine times out of ten.

Adding to IS professionals' satisfaction is a formalized goal-setting process Smialowski introduced when he joined Sears. Under the new process, employees reassess their personal development goals twice a year and give continual feedback to managers on how they are doing to help meet those objectives. The process has been so successful it has earned the IS organization a "best practice" for goal-setting within Sears. And it leads to the feeling among IS professionals that "our management team

DAVID JOEL

encourages an open environment that empowers the employee to take charge," Kniola says.

OPENING DATA AVAILABILITY

The openness extends to the information the IS organization has made available to Sears employees. For example, the IS organization recently developed a database called the Strategic Performance Report Systems that enables any Sears employee to track detailed sales perfotmance. Now an employee who works on the retail appliance systems can see how many refrigerators the Sears store in Cedar Rapids, Iowa, sold on any given day.

Of course, an organization the size of Sears starts out with some advantages. Sears consists of five companies within one: retail, home services, credit, telemarketing and commercial brands. It is this diversity within one company that Smialowski says gives Sears a leg up on other retailers. Welter agrees. "There are more opportunities here than I could exhausr in a lifetime," he says.

At the same time, Sears has to draw people to its suburban locatioo io Hoffman Estates, Ill., and overcome the perception that the retail industry is still comprised of glass house, monolithic computing. To meet those ends, Sears has expanded its operation to include three additional locations: the Chicago loop; Austio, Texas; aod Boise, Idaho.

Sears also encourages employees to act on their ideas. Seizing an opportunity where she knew it would make a difference, Beth Dlutowski, systems manager in logistics systems, initiated an IS intern program. It grew to be so successful that it led to eight new hires io its first year.

Jamie Trewartha, a team leader, says be is drawn most of all to the opportunity to work on credit systems at the fourth-largest credit-card company in the country. He is currently working on a system that will be the next generation in managing consumer credit. Through the automation of heuristic algorithms, the system can predict with a great deal of accuracy consumer behaviot, such as the probability of declaring bankruptcy, based on previous buying habits. The system is absolutely critical to Sears' financial health, as last year the company reported a decline in net income resulting from an overabundance of credit-card delinquencies.

The Sears facility is another benefit Trewartha enjoys. The modern, campus-like enviroooment stands out along the expressway like a colossal self-enclosed city that touched down io the relatively undeveloped landscape of Hoffman Estates. It ineludes a central mezzanine with vast amounts of greenery and waterfalls, a fitness facility, a cleaners, a salon, a bank and a general store. The cafeteria is the size of a football field and includes a Taco Bell and Pizza Hut. Trewartha's daughter attends the local daycare facility where his wife teaches.

EMPLOYEES HAVE A VOICE

In addition, this minimetropolis is one in which each employee has the opportunity to sound off at town meetings, facilitated by Bill Brannen, manager of workplace reinvention. At these meetings, people bring up hot issues, prioritize them and develop action plans. Once a year Brannen also conducts a "My Opinion Counts" survey.

Ten out of the 70 questions on this survey are able to establish a direct correlation between employee and customer satisfactioo," he says. "These figures we use as measures have continued to steadily go up." Demonstrating a true vote of confidence, 94% of the IS staffers participate in the survey — the highest participation percentage in any department at Sears.

All of these programs help underscore the value Sears places on its IS organization. As Smialowski is quick to point out, "If we don't make this environment a better place to work, we are not going anywhere." And by making it one of the Best Places to Work, he has taken it to the No. 2 spot on this year's list of non-IT companies.

SCHMIDT IS A FREELANCE WRITER IN HOFFMAN ESTATES, ILL.

THOSE WHO LIVE IN GLASS HOUSES . . .

BY LESLIE GOFF

Corning, Inc.'s overarching challenge to be a top employer can be summed up in three words: Location, locarion, location.

As the single large employer in Corning, N.Y., nestled among rolling hills in New York's Finger Lakes district, Corning has to work hard to attract people and harder still to keep them. The company and the community are closely tied, with about half of the 14,000 citizens employed at the manufacturer. Life is quiet here. Go to Wal-Mart. Eat dinoet at Perkins' restaurant. If you're feeling especially adventurous, drive to nearby Elmyra, a college town, to hear a band.

Location is the No. 1 reason candidates list for not accepting an offer at the company, notes Gertie Storch, information systems human resources manager. If an applicant thrives on city life, Storch knows they won't come to Corning. But if they've decided to trade urban excitement for a less stressful lifestyle, the company has a lot to offer, and as if in the hands of an alchemist, the town's disadvantages turn to gold. "If they have decided they want a better quality of life, we can attract them. We have a lot of challenging work here," she says.

During the past three years, Corning's IS organization has deployed a Microsoft Corp. Windows NT-based global frame-relay network over TCP/IP. It is rolling out Microsoft's Exchange electronic mail and has upgraded users to the latest Microsoft Office suite. And it is in the throes of an eoterprisewide PeopleSoft, Inc. implementation that has taken top priority and will extend across finance, human resources, the supply chain and procurement.

The technology overhaul will help position the 150-year-old company to meet the challenges of what may be the most ambitious — and emotionally altering — phase in its history: Although best known fot its popular houseware hrands such as Pyrex, Corelle and Corning Ware, Corning is refashioning itself ioto a high-tech company, a manufacturer of products for use in the telecommunications, environmental and advanced materials businesses.

In April, Corning cotopleted the sale of its most well-recognized unit, Corning Consumer Products Co., to Borden, Inc. for $603 million. Corning has retained an 8% interest in the division but will now focus nn advanced optics, specialty glass, television and video components, emissions controls and other high-tech product lines.

Despite its cozy, domestic image, in truth the $4.1 billion conglomerate's glass-making capabilities were never limited m household goods. The company invented the bulb glass for Thomas Edison's electric light; it created the first mass-produced glass picrure tubes for TVs; it cast the original telescope mirror for the Hale observatory; and it developed fiber optics. But in the public eye and rooted deep in the consciousness of its employees lives the

memory of Corning Glass Works, where old-world glass blowers crafted products for the home.

"Clearly, this is a part of the company that we have all grown up with and love and will miss," acknowledges Bob Gilchrist, Corning's chief information officer. The sale is "the best thing" for the division because of Borden's strong presence in the consumer products marketplace, but still, "it's a heartbreaking period of time," he says.

The most difficult aspect of managing the IS staff through immense technical and business change is implementing policies and strategies that give individuals the chance to react, says John Miles, director of global IT architecture and standards. So far, the company seems to be succeeding. Despite the upheaval, employees describe it as a place where they can achieve a work/life balance. And the IS turnover rate is a low 2% to 4%, according to *Computerworld*'s 1998 Best Places to Work survey.

PERKS TO BE HAD

Corning subsidizes three offsite child care centers. Employees have privileges at the local YMCA. Staff members recognize one another with rewards, such as gift certificates to local businesses or nominations for larger cash bonuses. Medical benefits are available to domestic partners. Wellness courses are second only to information technology classes on the corporate training calendar. In the company's new data center, workers appear relaxed yet focused. NASCAR calendars, Dilbert cartoons, candy dishes and family photographs brighten its large cubicles.

"We have a built-in balance because Corning is a nice place to live. We have low crime; it's not crowded or polluted; no one has a long commute; and you can get quickly to the Finger Lakes and ski resorts," says Miles, 44, who has worked at Corning since 1979. "And IT has its act together. We're connected to the business. We're well organized, and we stay current technically."

But while turnover is low overall, it is high among minority recruits. Minorities comprise only 6% to 10% of Corning's 500-person IS staff and less than 5% of IS management, according to the survey data. In striving to achieve more diversity, Corning has managed to attract minorities via campus recruiting, minority job fairs and the Internet. But it has a hard time keeping them in a small town that is overwhelmingly white.

"The community doesn't have a lot to offer a young African American female," explains Zainab Sanusi, a 29-year-old black woman who was recruited through Howard University's campus placement center and chose the company for its focus on quality of life.

Now an applications analyst on the financial systems deployment team, Sanusi was also recruited by IBM Credit Corp. in White Plains, N.Y. Although Big Blue's proximity to the Big Apple was appealing, Corning won out when it offered to fly her parents and boyfriend in for a weekend visit. That extra step, she says, "made me feel like Corning really cared."

IMPROVEMENTS STILL NEEDED

Sanusi does voice concerns about the company's and the community's lack of diversity but says efforts to address the corporate issues hold some promise. In January, the IS organization hosted its first Martin Luther King Day, including a panel discussion of whether his dream had come true in 1998. She attends quarterly diversity reviews with a vice president. And Corning has both a Society for Black Professionals and a Black Leadership Council that work to empower employees and reach out to the community.

Moreover, Sanusi was paired with an African American mentor, which she notes has not been a widespread Corning practice. In her first nine months, she worked on three different project teams, all involved in mission-critical applications.

Like Sanusi, most IS professionals who join Corning have made a deliberate, conscious choice to move to this serene outpost, Miles notes. Historically, the corporate culture, the benefits and the technology opportunities sustain them for many years.

"The challenge will always be that as we continue to grow and evolve into high-tech business from the old business, the nature of the company will change," Gilchrist says, "and we need to take the best of what we have into what we evolve into over the next five to 10 years."

GOFF IS A FREELANCE WRITER IN NEW YORK.

WHERE EVERYBODY KNOWS YOUR NAME . . .

Bob Gilchrist is a Corning company man through and through. The 25-year veteran of manufacturing and business unit management tried leaving for a while to work at GTE Corp., but five years later he returned.

"For me, what makes this a great place to work are the culture and the people," he says. "We have an easy flow of information — a casual environment. We're all on a first-name basis, from the chairman to anyone else in the company. We all feel we can count on each other. That is clearly why I came back."

He replaced former CIO Harvey Shrednick almost four years ago, reaching the apex of a career that began in Corning's glassware manufacturing and traversed nearly all of Corning's plants and business units except IS. From where he sits now, he says, his most taxing assignment is balancing business requirements with the restraints on his resources. The PeopleSoft implementation has consumed most of his organization's time, talent and budget.

"We question ourselves daily about whether this is really worth it or could we better use our resources to do other things for the company," he says. "We review that decision, and we always decide that it's necessary."

Gilchrist says that if his reputation as a company man makes any difference to his IS leadership, it's because he has the trust and acceptance of the company's managers and executives.

"I'm not an IT guy. I'm considered one of them, and I struggle with the acronyms, and I have to ask dumb questions," he says. "So maybe they feel more comfortable coming to me and asking questions."

DAVID JOEL

A TOUGH CULTURE TO DUPLICATE

BY LESLIE GOFF

Things may not be perfect in Xerox Corp.'s Rochester, N.Y., information management department, but no one's afraid to say so. In fact, the corporate culture not only encourages dissent but also provides plenty of avenues for its expression. Vicissitude is as valued as a winning lottery ticket.

So in staff meetings and water cooler conversations, information systems staffers gripe about the layers of bureaucracy created by the IS organization's 4-year-old outsourcing partnership with Electronic Data Systems Corp. Though the 800 Xerox staffers, who concentrate on new development, work side by side with the 2,000 EDS employees, who manage the infrastructure and maintain applications, a Xerox employee can't just shout over to an EDS cubicle and ask a co-worker for a favor. The Xerox team member must fill out a work ticket first.

Staffers lament the effect the $1.5 billion company's compensation structure sometimes has on its own decision-making. Thirty percent of each individual's salary is determined by corporate financial performance, which IS staffers say gives them pause when they have to buy a new server or expand information management facilities, for example.

But their complaints are gentle, tempered by an acknowledgment that their voice counts, management takes their opinions seriously, and with accountability comes a sense of autonomy.

"The initiatives here really make you feel you are being heard," says Tere Dominas, 36, a technical project leader for application infrastructure middleware who has been at the company for 12 years. "You don't have to be reluctant to say what's on your mind."

Employee groups are frequently invited to air their opinions with company chairman and Chief Executive Officer Paul Allaire. The annual employee motivation and satisfaction survey delves into such issues as favoritism, freedom to make decisions autonomously and flexibility to balance work and family.

An outside firm tabulates the survey results to ensure employee anonymity, and then work teams analyze and discuss them to establish goals for improvement. Management bonuses are tied to the results, "so there's some real teeth in it," says Bob Monastero, director of information management human resources. The process takes about 45 days every year and has led to such changes as a facilities upgrade that enlarged cubicles and allowed in more direct light, implementation of LANs that showcase Xerox technology and empower IS employees to work from remote locations and salary benchmarks that reassure employees they are being fairly compensated.

"Xerox values open and honest communication," says Kyle Kindle, 42, a business process consultant for global systems delivery. "That is real. You can be open and honest and still have your job the next day."

Diversity of people is as celebrated in Xerox's corporate culture as difference of opinion. The company recruits from campuses such as the University of Puerto Rico and other colleges with minority populations. It sponsors minority employee caucuses such as National Black Employee Association, Hispanic Association for Professional Advancement and the newest, Gay and Lesbian Employees at Xerox. Each caucus has a senior executive champion.

This year Xerox will offer sensitivity training addressing gay and lesbian issues to managers and employees, continuing a legacy of similar courses.

About a quarter of the IS staff and 20% of IS managers are minorities, according to *Computerworld*'s 1998 Best Places to Work survey. While the numbers could be higher, the strides Xerox has made in terms of supporting minority employees have become models for other companies and in 1995 earned recognition from the federal Glass Ceiling Commission.

Xerox is also family-friendly. Both Dominas and Kindle say they feel supported without question when family demands dictate they be away from the office. Parents can even request company grants for the child care center of their choice. And domestic partners are eligible for medical benefits.

The fusion of diverse people and opinions is essential in a climate that depends on teamwork and is always looking forward, managers say. Diversity also enhances IS recruiting and sustains retention. Annual turnover in the IS organization is only 2% to 4%, according to the Best Places to Work survey.

"Certainly diversity is an important element of our success," says Pat Wallington, corporate vice president and chief information officer. "I think IT professionals gravitate to the function because they love technology, but I think they like a company like Xerox because these policies make success possible."

TRACY BROLL

TIDE OF OPINION COULD SHIFT

But the mood could be changing for Xerox's well-adjusted IS employees. As this article was going to press, the company announced it would lay off 9,000 workers while it transitions to "digital markets," focusing on sales of its new network printers. The layoffs, which will be achieved mainly by voluntary staff reductions, were first subjected to Xerox's usual channels of communication: According to a press release, the layoffs were six months in the planning and analysis stage, with 50 different teams involved. How the announcement will affect IS staffers remained unclear.

"We don't anticipate any layoffs [in information management]," Monastero says. "We are allowing people to participate in early retirement programs, and that, coupled with normal turnover, should accommodate productivity goals for IM. Xerox considers IM core skills necessary for the achievement of the corporate vision for Xerox 2000 and 2005."

Ironically, Xerox's willingness to make such sweeping choices to improve company performance are part of what inspires IS employees' faith in the company. Dominas notes that in the bigger picture of growing the company, "sometimes things are out of your control."

"We're here because we have a business to run," Monastero says, "but in the course of that, we are as sensitive to employees' needs as we can be."

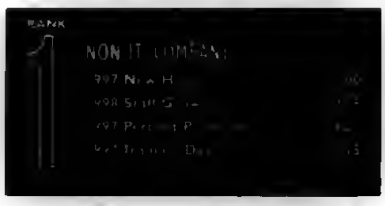
GOFF IS A FREELANCE WRITER IN NEW YORK

OUT OF THE ASHES OF INDUSTRY CONSOLIDATION RISES A TOP-RANKED IT ORGANIZATION

BY JEFFREY D. ZBAR

Marshall Gibbs and Kris Kocan personify two views of professional life at CSX Technology, Inc., the IT division of $10 billion railroad and transportation conglomerate CSX Corp., based in Richmond, Va.

Gibbs, 32, wears business suits to the offices in Jacksonville, Fla. The vice president of enterprise technology services has led some of the company's most inventive information technology projects and attends meetings with some of the IT industry's leading thinkers.



Then there's Kocan, a boyish, 25-year-old IT architect who prefers to wear chinos and polo shirts to work. He arrived from IBM two years ago. Like Gibbs, Kocan thrives on applied technology. But he shies away from the corporate management track that Gibbs eagerly follows.

Despite their apparent differences, both men represent the new breed of IS worker at CSX Technology: people who have been recruited to rebuild what was once a traditional railroad company and its IT infrastructure.

In the past few years, like much of the rest of the transportation industry, CSX has transformed itself from a mere mover of freight to a logistics and supply-chain manager. Today the company's IT organization has received accolades for its pioneering work with Java and its successful foray into electronic commerce.

It could be argued that much of the credit lies with John F. Andrews, president of CSX Technology and chief information officer of CSX Corp. In 1993, he took the IT division from an organization subservient to the corporate parent's railroad and transportation needs to one that is central to its future.

Before agreeing to take the job, Andrews says, he demanded a "seat at the table" in the corporation: the ability to call his own shots without begging permission from chairman John Snow. He was granted that autonomy. With experience in state and local government, healthcare, cellular and telecommunications, as well as transportation, Andrews had the requisite knowledge to reshape the CSX Technology organization into one that is directly accountable for its budget. At the core of this new organization, he says, would be cost and benefit. For every $1 spent in development, he'd expect a $10 return.

Andrews had his work cut out for him. When he arrived, he found an organization that had what he calls "a green screen mentality," meaning its technology direction had been stripped of innovation. So he began shaking up the rank and file.

First, he threw out the company's annual review process and instituted a quarterly review and bonus program. This, he says, helped the company "weed out" nonperformers, leaving only top performers focused on development. Those who remained were encouraged to bring project ideas to management for review and implementation. Andrews also applied pressure to project development and delivery times so 90% of 250+ projects delivered each year would not go beyond a 120-day development cycle.

But he didn't stop there. Recognizing that the division was bogged down in bureaucracy, he cut the number of titles and levels of hierarchy from 250 to 30. He also routinely solicits employee feedback on how the company's being run.

Andrews next proved his division could deliver. Within minutes of learning that Java existed in December 1995, Andrews had Gibbs spearheading a directive to make the programming language the backbone of the company's integrated logistics system, Transportation Workstation Net. Thirty days later, the beta program was rolled out. Ninety days later, the program went live. The extranet-based system lets clients track shipment location and delivery estimates, thus bolstering CSX Technology's renewed focus on customer service and its bottom line.

The initiative led to a product called TWSNet Premium, which will eventually be sold on the market. It lets companies access data about any shipment on any freight or shipping company that tracks content on a Web-based system.

Overall, in 1997, the firm booked more than $300 million in quantifiable benefits resulting from IT product.

KEEPING UP

To succeed in this transformation, Andrews had to make sure CSX Technology was a viable employer for the industry's top talent. So in 1996, sensing the company's pay scale lagged behind the industry's, he instituted a six-month review of market salaries. Last year, he invested $5 million to "true up" salaries across the board.

In addition to raising salaries, he introduced a series of bonus programs that for some amount to 25% of compensation. These include quarterly bonuses, a "leadership bound" bonus program for the 120 people who have made the greatest contribution to the organization and "All Star" bonuses that reward the Top 5 performers each quarter with training, a special lunch and an all-expense-paid weekend at a top-end resort.

Knowing astute IT workers are keen to stay atop leading-edge technology and skills, Andrews also introduced bonuses for those who spend 40 hours a year in training. Additional training is available for those who want it. Apparently, many do. IT employees averaged between 13 and 15 days of training in 1997, while the company spent an average of $2,000 per employee on all training programs.

As the company heads into summer, it faces yet another IT challenge: folding its 42% acquisition of rail line Conrail into the CSX Technology system. Previous rail industry mergers have proved that a lack of IT support can make that difficult task even more challenging, says project manager Sidney Wells, who works closely with Andrews. So the company has put hundreds of IT workers on the task — people who possess the skills Andrews pushed for upon his arrival five years ago.

It seems the dividends of affording Andrews a "seat at the table" are paying off.

ZBAR IS A FREELANCE WRITER IN CORAL SPRINGS, FLA.

LYNN SILER

COMMUNICATION: THE KEY TO GLOBAL SUCCESS

By Brian Franks

At the Chandler, Ariz., office of Avnet, Inc., it was crunch time: a periodic moment of truth for the members of the IS department who were completing the rollout of a major SAP AG R/3 implementation in Europe.

The last 250 users had just been brought on board. But suddenly something went wrong. The information systems staff stared in disbelief as the enterprise resource planning (ERP) system went from a 1-second response time to a 30-second delay, just like that.

At such a level, the sales force cannot deliver orders, the warehouse doesn't know which product to pick or ship, and Avnet can bid farewell to more than $1 billion in sales revenue. Fully aware of the implications, the IS staffers were left with no choice but to roll up their sleeves and solve the problem quickly. So they worked 36- to 38-hour shifts over a seven-day period, putting their personal lives on hold. Yet somehow they resolved the problem and came through the experience sounding upbeat.

"Throughout the troubleshooting, there was never a point in time when we were worried," says George Reichert, director of advanced technologies. From start to finish, Chief Information Officer and 10-year veteran Steve Bandrowczak was with them in the trenches, making sure morale was high and everyone was OK. Moreover, thanks to the IS team's ability to explain what was happening, both within the division and to the external business units, "the business groups knew what we were up against the whole time, and we knew exactly what the system would do for them," Reichert says. This level of open communication and mutual understanding was part of what helped Avnet beat out information technology hotshots and land among the Top 5 of this year's IT-related Best Places to Work in IS.

Avnet may not be a household name, but it is one of the world's largest distributors of electronic components and computer products, with revenue of $5.39 billion in 1997. It has been a major behind-the-scenes distribution powerhouse for decades, having been incorporated in 1955, and it stocks more than 1 million different components in its warehouses. It resells these items to more than 100,000 OEMs.

Headquartered in Great Neck, N.Y., but with its data center in Arizona, Avnet has expanded rapidly for years. In the past decade, as the demand for electronic products has increased worldwide, Avnet has increased its global operations by acquiring 20 companies and has become the No. 2 semiconductor company, behind Arrow. It has offices in North America, Europe, Asia and Africa. It was No. 273 on the 1996 Fortune 500 list.

This aggressive expansion and global reach has certainly presented many challenges for Avnet's IS staffers. For example, they have had to roll over each newly acquired company to existing systems. Also, the IS department is increasingly faced with issues arising from 'round-the-clock global support, language differences and telecommunications infrastructure capabilities in new countries (see "Computer Guru or Cultural Attaché?" page S30). Add this to the ubiquitous challenge of keeping pace with technology changes, and you've got an IS department that never seems to rest.

When asked what globalization means to an IS employee, Peter Rogers, vice president of technology services, says: "Life at Avnet keeps you on your toes. You have to know who you are dealing with and how to deal with them."

For example, as Avnet expanded into the Asia-Pacific region, it faced the problem of finding a player that could provide dial back-up capabilities, redundancy and recovery from outages. Similarly, during the European expansion efforts, Avnet had difficulty finding one integrator that could support all ends of its LAN and desktop rollout.

Fortunately, Avnet employs an IS staff that enjoys tackling these daily challenges and, moreover, doesn't want to leave. In fact, last year it saw less than 2% of its staff turn over. So at a time when it's easy for an IS professional to pack it up and move to another employer, typically for a higher salary, why is Avnet so successful at keeping its people around?

As Bandrowczak puts it, "We're very flexible here. We listen to our staff. We conduct quarterly surveys, offer flex hours and continue to make sure that their resumes are marketable." In other words, Avnet's IS staffers are given the tools they would need to jump ship, but they remain faithful because of Avnet's dedication to understanding their needs.

HIGHLY VALUED EMPLOYEES

"Avnet treats its employees as its No. 1 asset," says Rogers, who has been at Avnet for 17 years and attributes his stay to personal growth, career opportunities and continual challenges.

Rogers is not alone. Each IS employee receives more than 20 days of training per year, from both internal and external sources. In addition, Avnet expects its training budget per IS employee to increase by approximately 20% this year. Training at Avnet, though, goes above and beyond mere technical instruction.

In order for IS employees to be successful at Avnet, they must also be able to interact with the business units. Bandrowczak has laid the foundation for this by starting two initiatives. One, called "Breakfast with Steve," is a monthly meeting where he discusses the state of Avnet's business with his IS staff.

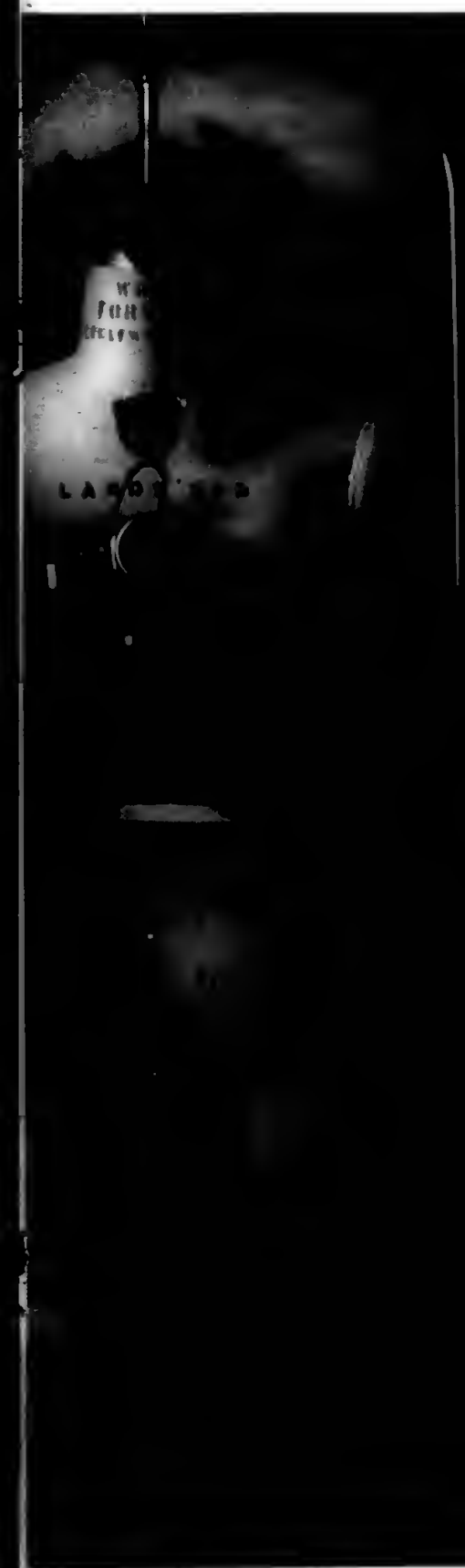
The other is an informal training session entitled "Meet Your Customer." More than 90% of the local IS staffers attend on a regular basis. Every month, one or two top managers from an Avnet business unit attend an IS-sponsored luncheon to deliver a presentation on their specific line of business. They discuss what the business does, what their customers require and what they need to be competitive.

So far this year, the IS group has hosted two-hour luncheons for both the OEM marketing group and the computing marketing group. As a result of these meetings, IS has gained first-hand knowledge that will help the staff develop and support the technology for the particular groups.

It is this type of rapport building and business awareness that carried the IS staff through the ERP crisis. Reichert, who has been at Avnet for four years, says, "At Avnet, nothing's a mystery. We understand what the businesses want."

FRANKS IS A FREELANCE WRITER IN BOSTON.

DAN COOGAN



AS TECHNOLOGY TAKES A FRONT SEAT

The New IS

IN NON-IT COMPANIES, IS PROFESSIONALS

Adventurers

ARE IN FOR A WILD RIDE

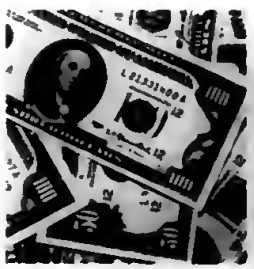
PHOTOGRAPHY BY DAVID GRANDORF

A Few Reason
Chosen As The Be

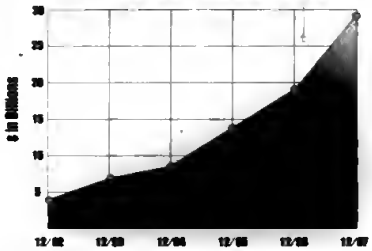
1. For the third year in a row, a *Computerworld* survey named Computer Associates one of the "Best Places To Work" for IS professionals. CA was the highest rated software company among the top 100 organizations. Evaluations were based on a wide range of criteria, including benefits, salary levels and increases, staff growth and promotions, turnover rates, employee empowerment, training programs, use of technology, and diversity in the workplace.

2. CA offers some of the most competitive compensation and benefit packages in the industry. With a strong commitment to internal promotion and development, CA offers all its employees plenty of opportunity for rapid career advancement and substantial financial rewards.

3. As CA shareholders, thousands of CA employees who own billions of dollars of CA stock have benefited from an amazing 783% rise in the value of CA stock over the last five years. That translates to a compound annual growth rate of 55%. And recently, *Money Magazine* rated CA stock as one of the best stocks to own.



CA Market Capitalization



4. Computer Associates offers extremely generous benefits, profit sharing and employee stock option plans. Over the years, CA has contributed millions of dollars towards these employee benefit programs.

5. As one of the high-tech industry's most progressive companies, CA offers a broad range of employee benefits such as a corporate-wide commitment to training and continuing education, subsidized on-site child care (Montessori Method) and world-class, physical fitness facilities.

6. CA makes more kinds of software for more kinds of computers than any other company in the world. That enables us to offer our clients platform independent solutions.

7. To encourage continuing education, Computer Associates offers a generous tuition-reimbursement program for all of its employees.

8. With literally thousands of seminars and training programs held every year, Computer Associates invests millions of dollars in employee training and education.

*Based on 12/31/97 data.

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All product names referenced herein are trademarks of their respective companies.

s Why CA Was st Place To Work.

9. CA offers company-paid medical and dental coverage for employees, spouses, domestic partners, and other dependents.

10. At CA, an informal, nonbureaucratic atmosphere and very flat management structure encourages and rewards entrepreneurial spirit, personal ambition and creativity.

11. *Working Mother* magazine named CA one of the 100 Best Companies in America for Working Mothers in 1997. This award speaks to CA's strong commitment to fostering a corporate culture that is sensitive to the needs of both working mothers and fathers, and creating a family friendly environment.

12. CA employees tend to have 74% more fun than employees of other high-tech companies.

13. CA clients include the world's leading corporations and governments, as well as more than 95% of the Fortune 500.

14.

Every day CA serves free breakfast to thousands of CA employees. Monday is donut day, Tuesday is cereal, Wednesday is bagels, Thursday is muffins, and Friday is coffee cake.

15. CA employees work on the broadest product portfolio in the industry, that includes systems and network management, database and application development, and business application software.

16. CA is financially solid as a rock with a 22-year track record of success and a market capitalization of approximately $30 billion.*

17. CA encourages civic involvement and volunteerism with a generous two-for-one charity-matching program. For every dollar a CA employee donates to a charity, CA matches it with two. CA is a very active corporate supporter of many children's charities including The National Center For Missing And Exploited Children™, Make-A-Wish Foundation®, and The Smile Train.

18. CA employees get a chance to work on industry leading products like CA's award-winning enterprise management software, Unicenter® TNG™ and the revolutionary new object DBMS, Jasmine™.

19. CA offers a fun, exciting, stimulating, fast-moving, challenging work environment that brings out the best in its employees.

For more information, call 1-800-225-5224 or visit www.cai.com

COMPUTER ASSOCIATES®
Software superior by design.

are anything but dull, behind-the-scenes slogs. Once spiritually poor cousins to their cohorts at information technology companies, whose jobs by definition are core to their employers' products, information systems workers at non-IT companies are grabbing the spotlight as IT itself heads to the front lines of business.

Standard measuring sticks such as pay and benefits aside, it is an intangible sense of purpose and belonging that characterizes the technology workers at the non-IT companies ranking high in *Computerworld*'s Best Places to Work Survey. Whether they are traveling to the four corners of the earth to digitize compelling Web site content, such as Lagman, or more likely building Internet systems to generate electronic commerce revenue, such as the folks at Federal Express Corp. and Fleet Financial Group, Inc., or developing the IT infrastructure to support new lines of deregulated business, such as the technology group at PECO Energy Co., these IT workers are feeling appreciated, important and needed.

"We definitely feel and see we're part of the heartbeat of the corporation," says Susan Goeldner, manager of Internet technology at Memphis-based delivery industry powerhouse FedEx.

"I never would have guessed I'd be working with folks the likes of Will Steger or Bill Cotter," Lagman says, referring to yet another adventurer with whom he has, well, crossed paths. "Before, I didn't work much with external people. I worked mostly with other IT folks. I didn't get to see much of the company, and I didn't get to see much of the world."

Before Dodgeville, Wis.-based Lands' End dubbed Lagman with the unlikely title of adventurer technical outfitter, this 12-year veteran of the IT profession served in the more pedestrian role of providing workstation and network support. Now he travels the globe equipping adventurers with digital cameras and laptop computers to send accounts of their sojourns to Lands' End's Web site. This activity marks a key extension of Lands' End's signature practice of publishing adventurers' essays in its clothing catalog. Within the past year, Lagman has journeyed to the northern Atlantic to work on a Viking replica ship and to Mexico's Gulf of California to outfit a trawler retracing novelist John Steinbeck's Sea of Cortez studies, as well as to Alaska.

> job as adventurer technical outfitter at Lands' End has led him to Viking ships, Mexican trawlers and Alaskan dog sleds: "I don't think there are too many IS folks who can say they've been dragged across Alaska by 10 dogs"

At the IS arm of Providence, R.I.-based Fleet, the same sense of seeing the outside world emerges not on a Viking ship but in David Fingerman's online banking system. Fingerman, who is vice president of online financial services, describes his role as developing technology to support the bank's customers in what will eventually include Web-based banking. Fleet presently offers a proprietary dial-up PC banking system and hopes to launch Web-based banking by the middle of this year. Where Fingerman previously labored in the blocking and tackling roles of integrating databases within the ever-expanding-by-acquisition Fleet orbit, his role now entails more glorious open field running on the paydirt of new accounts.

This invigoration feeds itself as talented young IT recruits view institutions such as Fleet as viable places to ply their trade. "In the past, young people didn't really think of banks as great places to work in technology, but that's changing," Fingerman says. Of course, Fleet must compete with other companies for this talent. But as the skill level rises, so does Fleet's ability to hook its customers into its banking systems, and so does its ability to find new customers by mining voluminous databases for nuggets of spending information. In fact, Fingerman notes, the lines that distinguish an IT company from a non-IT company are blurring.

IS STAFFERS ASSERT THEMSELVES

The rise in stature of IS departments has also emboldened workers in their relationships with technology suppliers. Suppliers of Web technology know that aggressive electronic commerce companies such as FedEx make good showcase accounts, and this is giving IS workers newfound clout. Server software and hardware suppliers like to boast that their products are supporting a site where half of the 350,000 daily hits are transaction-related, be they shipping, tracking, rate finding or some other business-related activity.

"The vendors used to be less responsive," FedEx's Goeldner says. "It was like, 'Oh, you don't like our product? We'll move on to the next customer.' But now it feels like we really are driving the technology."

That scenario should also play out in the energy industry. As utility companies thrust into a new age of deregulated competition, IT is underpinning many of their competitive efforts. At PECO in Philadelphia, for instance, a new subsidiary called Horizon Energy is marketing energy products and services nationwide. PECO Chief Information Officer Cassandra Matthews says her department is busy building the software that will support this initiative and developing programs that let customers consolidate bills for many locations into one, thereby simplifying management for them and providing volume discount rates.

This elevated sense of place does come with a downside, as it draws the more watchful eyes of employers' top brass. "Sometimes you want to crawl back in your hole," FedEx's Goeldner says. And the hours are long. Goeldner says she routinely works 60-hour weeks, compared with 40 or 45 in pre-Web days, and is in danger of losing nonaccruing vacation days. Fleet's Fingerman just took his first vacation in two and a half years.

Such is the price of being a technologist in a technology age.

HALPER IS A FREELANCE WRITER IN SAN FRANCISCO.

Best Places to Work in IS: IT COMPANIES

	COMPANY	SEGMENT	NEW IS HIRES 1997	IS STAFF CHANGES 1997	IS TURNOVER 1996	IS COMPENSATION 1997	TRAINING BUDGET 1997	DAYS OF TRAINING 1997	IS STAFF 1997: WOMEN	IS STAFF 1997: MINORITIES
1	**SOLECTRON CORP.** Milpitas, Calif. www.solectron.com	Computers/Electronics	▪▪▪	▪▪▪▪▪	▪▪▪▪▪	▪▪▪▪	▪▪▪	▪▪▪▪▪	▪▪▪▪	▪▪▪▪▪
2	**XEROX CORP.** Stamford, Conn. www.xerox.com	Computers/ Office Equipment	▪▪▪▪	▪▪▪▪▪	▪▪▪▪	▪▪▪▪▪	▪▪▪▪	▪▪▪	▪▪▪▪▪	▪▪▪
3	**3COM CORP.** Santa Clara, Calif. www.3com.com	Computers/ Office Equipment	▪▪▪▪	▪▪▪▪▪	▪▪▪▪	▪▪▪▪▪	▪▪	▪▪▪▪	▪▪▪	▪▪▪
4	**COMPUTER ASSOCIATES INTERNATIONAL, INC.**, Islandia, N.Y. www.cai.com	Computers/Software	▪▪▪▪▪	▪▪▪▪▪	▪▪▪▪	▪▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪
5	**AVNET, INC.** Great Neck, N.Y. www.avnet.com	Computers/Electronics	▪▪	▪▪▪	▪▪▪▪▪	▪▪▪	▪	▪▪▪▪▪	▪▪▪	▪▪
6	**BAY NETWORKS, INC.** Santa Clara, Calif. www.baynetworks.com	Computers/ Office Equipment	▪▪▪	▪▪▪▪▪	▪▪	▪▪▪▪▪	▪▪▪▪	▪▪▪▪▪	▪▪	▪▪▪▪
7	**TECH DATA CORP.** Clearwater, Fla. www.techdata.com	Computers/ Office Equipment	▪▪	▪▪▪▪	▪▪	▪▪▪	▪	▪▪▪▪▪	▪▪	▪
8	**KPMG PEAT MARWICK LLP** Montvale, N.J. www.kpmg.com	Professional Services/ Consulting	▪▪▪▪	▪▪▪▪▪	▪▪	▪▪▪▪▪	▪▪▪▪	▪▪▪	▪▪	▪▪
9	**PRICE WATERHOUSE LLP** New York www.pw.com	Professional Services/ Consulting	NA	▪▪▪▪▪	▪▪	▪▪▪▪▪	NA	▪▪▪▪▪	▪▪	▪▪
10	**EMC CORP.** Hopkinton, Mass. www.emc.com	Computers/ Office Equipment	▪▪▪	▪▪▪▪▪	▪▪▪▪	▪▪	▪▪▪	▪▪▪▪	▪▪▪	▪▪▪▪
11	**AT&T CORP.** New York www.att.com	Telecommunications	▪▪▪▪▪	▪▪	▪▪▪▪	▪▪▪▪▪	▪▪	▪▪▪▪	▪▪▪▪	▪▪▪
12	**COMPUTER TASK GROUP, INC.** Buffalo, N.Y. www.ctg.com	Professional Services/ Consulting	▪▪▪▪	▪▪▪▪	▪	▪▪▪▪▪	▪	▪▪▪	▪▪▪	▪
13	**TEXAS INSTRUMENTS, INC.** Dallas www.ti.com	Computers/Electronics	▪▪▪	▪	▪▪	▪▪▪▪▪	▪▪	▪▪▪	▪▪	▪▪
14	**RWD TECHNOLOGIES, INC.** Columbia, Md. www.rwd.com	Professional Services/ Consulting	▪▪	▪▪▪▪	▪▪▪▪	▪▪▪	▪▪▪▪	▪▪▪	▪▪	▪▪▪
15	**AMERICAN MANAGEMENT SYSTEMS, INC.** Fairfax, Va. www.amsinc.com	Professional Services/ Consulting	▪▪▪	▪▪▪▪	▪▪	▪▪▪▪	▪▪	▪▪▪	▪▪▪▪	▪
16	**FRONTIER CORP.** Rochester, N.Y. www.frontiercorp.com	Telecommunications	▪▪▪	▪▪▪	▪▪	▪▪	▪▪	▪▪	▪▪	▪▪
17	**DELL COMPUTER CORP.** Round Rock, Texas www.dell.com	Computers/ Office Equipment	▪▪▪	▪▪▪	▪▪	▪▪▪	▪▪	▪	▪▪	▪▪
18	**DELOITTE & TOUCHE LLP** New York www.deloitte.com	Professional Services/ Consulting	▪▪	▪▪▪	▪▪	▪▪	▪▪▪	▪▪	▪▪	▪▪
19	**KEANE, INC.** Boston www.keane.com	Professional Services/ Consulting	▪▪▪	▪▪▪	▪	▪▪	▪▪	▪	▪▪	▪▪
20	**ANDERSEN CONSULTING** Chicago www.ac.com	Professional Services/ Consulting	▪▪▪	▪▪	▪▪	▪▪▪	▪▪▪	▪▪▪	▪▪	▪
21	**LSI LOGIC CORP.** Milpitas, Calif. www.lsilogic.com	Computers/Electronics	▪▪	▪▪▪	▪▪	▪▪	▪▪▪	▪▪▪	NA	NA
22	**ERNST & YOUNG** New York www.eyi.com	Professional Services/ Consulting	▪▪▪	▪▪▪	▪▪	▪▪▪	▪▪▪	▪	▪▪	▪▪
23	**COMPAQ COMPUTER CORP.** Houston www.compaq.com	Computers/ Office Equipment	▪▪▪	▪▪▪	▪▪	▪▪	▪	▪▪	▪▪	▪
24	**SUN MICROSYSTEMS, INC.** Palo Alto, Calif. www.sun.com	Computers/ Office Equipment	▪▪▪	▪	▪▪	▪▪	▪	▪	▪▪▪	▪▪
25	**ADVANCED MICRO DEVICES, INC.** Sunnyvale, Calif. www.amd.com	Computers/Electronics	▪▪▪	▪▪▪	▪▪▪	▪	▪	▪	▪	▪▪▪

Note: Charts represent a selection of the total criteria used to rank the overall Best Places list

Best Places to Work in IS: NON-IT COMPANIES

COMPANY	INDUSTRY	NEW IS HIRES 1997	IS STAFF CHANGES 1997	IS TURNOVER 1996	IS COMPENSATION 1997	TRAINING BUDGET 1997	DAYS OF TRAINING 1997	IS STAFF 1997: WOMEN	IS STAFF 1997: MINORITIES
CSX CORP. Richmond, Va. www.csx.com	Transportation	▪▪▪	▪▪▪	▪▪	▪▪▪	▪▪	▪▪▪	▪▪▪	▪▪
SEARS, ROEBUCK AND CO. Hoffman Estates, Ill. www.sears.com	Retail	▪▪▪	▪▪▪	▪▪	▪▪▪	▪▪▪	▪▪	▪▪	▪▪
CORNING, INC. Corning, N.Y. www.corning.com	Manufacturing	▪	▪▪	▪▪	▪▪▪	▪▪▪	▪▪	▪▪	▪
THE PRINCIPAL FINANCIAL GROUP Des Moines, Iowa www.principal.com	Financial Services	▪▪▪	▪▪	▪▪	▪▪	NA	▪▪▪	▪▪▪	▪▪
CINCINNATI FINANCIAL CORP. Cincinnati www.cinfin.com	Insurance	▪▪	▪▪▪	▪▪	▪▪▪	▪▪	▪▪	▪▪▪	▪
THE CHASE MANHATTAN CORP. New York www.chase.com	Financial Services	▪▪▪	▪▪	▪▪	▪▪▪	NA	▪▪	▪▪	▪▪
THE PROGRESSIVE CORP. Mayfield Village, Ohio www.auto-insurance.com	Insurance	▪▪▪	▪▪▪	▪▪	▪▪▪	NA	▪▪	▪▪	▪▪
PACIFICARE HEALTH SYSTEMS, INC. Santa Ana, Calif. www.phs.com	Healthcare	▪▪	▪▪▪	▪	▪▪	▪▪	▪▪	▪▪▪	▪▪▪
FEDERAL EXPRESS CORP. Memphis www.fedex.com	Transportation	NA	▪▪	▪▪	▪	▪▪	▪▪	▪▪	▪▪
UNION CAMP CORP. Wayne, N.J. www.unioncamp.com	Forest/Paper Products	▪	▪▪	▪▪	▪▪	▪▪	▪▪	▪▪	▪
HONEYWELL, INC. Minneapolis www.honeywell.com	Electronics/Electrical	▪▪	▪▪	▪▪	▪▪	▪▪	▪▪	▪▪	▪
METROPOLITAN LIFE INSURANCE CO. New York www.metlife.com	Insurance	▪▪▪	▪▪	▪▪	▪▪	▪▪	▪▪	▪▪	▪▪
TRANSAMERICA CORP. San Francisco www.transamerica.com	Financial Services	▪	▪▪	▪▪	▪▪	▪▪	▪▪	▪▪	▪▪
J. B. HUNT TRANSPORT SERVICES, INC. Lowell, Ariz. www.jbhunt.com	Transportation	▪▪	▪▪	▪▪	▪▪	▪▪	▪▪	▪▪	▪
UNITED HEALTHCARE CORP. Minnetonka, Minn. www.unitedhealthcare.com	Healthcare	▪▪▪	▪▪	▪	▪▪	NA	▪▪	▪▪	▪
WAL-MART STORES, INC. Bentonville, Ark. www.wal-mart.com	Retail	▪▪▪	▪▪	▪	▪▪	▪▪	▪▪	▪▪	▪
BINDLEY WESTERN INDUSTRIES, INC. Indianapolis www.bindley.com	Wholesale	▪	▪▪	▪▪	▪▪	▪▪	▪	▪▪	▪▪
STUDENT LOAN MARKETING ASSOCIATION Washington www.slma.com	Financial Services	▪▪	▪▪	▪	▪▪	▪▪	▪▪	▪▪	▪▪
FIRST CHICAGO NBD CORP.* Chicago www.fcnbd.com	Banking	▪▪▪	▪▪	▪	▪▪	▪▪	▪	▪▪	▪▪
THE HOME DEPOT, INC. Atlanta www.homedepot.com	Retail	▪▪▪	▪▪	▪	▪▪	▪▪	▪▪	▪▪	▪▪
HARLEY-DAVIDSON, INC. Milwaukee www.harley-davidson.com	Motor Vehicles and Parts	▪	▪▪	▪▪	▪	▪▪	▪	▪	▪
CONTINENTAL AIRLINES, INC. Houston www.flycontinental.com	Transportation	▪▪	▪▪	▪▪	▪	▪▪	▪▪	▪▪	▪
AMERICAN FAMILY INSURANCE GROUP Madison, Wis. www.amfam.com	Insurance	▪▪	▪▪	▪▪	▪▪	▪▪	▪▪	▪▪	▪
CENDANT CORP. Parsippany, N.J. www.cendant.com	Transportation/ Financial Services/ Hospitality	▪	▪▪	NA	▪▪	▪▪	▪▪	▪▪	▪
RELIASTAR FINANCIAL CORP. Minneapolis www.reliastar.com	Financial Services	▪▪	▪▪	▪	▪▪	▪▪	▪	▪▪	▪

Reflections

Decided within minutes of learning Java existed in 1995 to make it the backbone of CSX's integrated logistics program: "If you're a recognized IT company, you have an easier time keeping people involved and proud."

John F. Andrews
CSX CORP.

THE AVERAGE INCREASE IN COMPENSATION AT FINANCIAL SERVICES FIRMS WAS 9.5% IN 1997 — 2% HIGHER THAN IN OTHER INDUSTRIES.

Returned to Corning five years after he tried leaving for awhile: "For me, what makes this a great place to work are the culture and the people. . . . We're all on a first-name basis."

Bob Gilchrist
CORNING, INC.

FINANCIAL SERVICES COMPANIES WERE THE SECOND-LARGEST VERTICAL MARKET SEGMENT ON THE BEST PLACES LIST — AFTER IT COMPANIES.

* First Chicago NBD Corp. announced a merger with Banc One Corp. in April 1998

** Brooklyn Union Gas Co. became Brooklyn Union, a subsidiary of KeySpan Energy Corp., in the fall of 1997

Best Places to Work in IS: NON-IT COMPANIES

Estimating that as CEO, he spends at least 30% of his time dispensing free network consulting wisdom to corporate customers: "We're one of our own largest customers."

Tom Thomas
3COM CORP.

OF THE 100 BEST PLACES TO WORK COMPANIES, 10% SAY THEY SPEND MORE THAN $10,000 PER PERSON PER YEAR ON TRAINING.

Diversity of people is as celebrated as difference of opinion at Xerox: "As a manager, you want to achieve the kind of environment you would want to work in."

Pat Wallington
XEROX CORP.

ONLY 15 COMPANIES DUBBED THE BEST PLACES TO WORK IN IS HAVE REMAINED ON THE LIST FOR AT LEAST FOUR YEARS RUNNING.

COMPANY	INDUSTRY	NEW IS HIRES 1997	IS STAFF CHANGES 1997	IS TURNOVER 1996	IS COMPENSATION 1997	TRAINING BUDGET 1997	DAYS OF TRAINING 1997	IS STAFF 1997: WOMEN	IS STAFF 1997: MINORITIES
CATERPILLAR, INC. **Peoria, Ill.** www.caterpillar.com	Industrial and Farm Equipment								
CIRCUIT CITY STORES, INC. **Richmond, Va.** www.circuitcity.com	Retail/Electronics								NA
MERCANTILE BANCORP, INC. **St. Louis** www.mercantile.com	Banking								
EDISON INTERNATIONAL **Rosemead, Calif.** www.edisonx.com	Utilities								NA
CONSOLIDATED STORES CORP. **Columbus, Ohio** www.cnstores.com	Retail								
INTERNATIONAL PAPER CO. **Purchase, N.Y.** www.ipaper.com	Forest/Paper Products								
LANDS' END, INC. **Dodgeville, Wis.** www.landsend.com	Apparel								
ARMSTRONG WORLD INDUSTRIES, INC. **Lancaster, Pa.** www.armstrong.com	Building Materials								
BROOKLYN UNION GAS CO.**** **Brooklyn, N.Y.** www.bug.com	Utilities								
JACOBS ENGINEERING GROUP, INC. **Pasadena, Calif.** NA	Construction								
JOHNSON CONTROLS, INC. **Milwaukee** www.jci.com	Manufacturing							NA	
CABOT CORP. **Boston** www.cabot-corp.com	Chemicals								
USAA **San Antonio** NA	Insurance					NA			
ADOLPH COORS CO. **Golden, Colo.** www.coors.com	Beverages								
PEPSICO, INC. **Purchase, N.Y.** www.pepsico.com	Beverages								
THE ALLSTATE CORP. **Northbrook, Ill.** www.allstate.com	Insurance								
THE MEAD CORP. **Dayton, Ohio** www.mead.com	Forest/Paper Products					NA			
UNIVERSAL HEALTH SERVICES, INC. **King of Prussia, Pa.** www.uhsinc.com	Healthcare							NA	
AMGEN, INC. **Thousand Oaks, Calif.** www.ext.Amgen.com	Pharmaceuticals								NA
NAVISTAR INTERNATIONAL CORP. **Chicago, Ill.** www.navistar.com	Motor Vehicles and Parts					NA		NA	NA
THE ST. PAUL COS. **St. Paul, Minn.** www.stpaul.com	Insurance								
FANNIE MAE **Washington** www.fanniemae.com	Financial Services					NA			
STANDARD COMMERCIAL CORP. **Wilson, N.C.** NA	Tobacco	NA							
HEALTHSOUTH CORP. **Birmingham, Ala.** www.healthsouth.com	Healthcare								
THE MINNESOTA MUTUAL LIFE INSURANCE CO., St. Paul, Minn. www.minnesotamutual.com	Insurance								

*** MAPCO, Inc. was acquired by The Williams Cos. in March 1998

**** Barnett Banks, Inc. merged with NationsBank in January 1998

Note: Charts represent a selection of the total criteria used to rank the overall Best Places list. Industry refers to primary line of business.

Best Places to Work in IS: NON-IT COMPANIES

COMPANY	INDUSTRY	NEW IS HIRES 1997	IS STAFF CHANGES 1997	IS TURNOVER 1996	IS COMPENSATION 1997	TRAINING BUDGET 1997	DAYS OF TRAINING 1997	IS STAFF 1997: WOMEN	IS STAFF 1997: MINORITIES
THE LINCOLN ELECTRIC CO. Cleveland www.lincolnelectric.com	Electronics/Electrical								
RITE AID CORP. Camp Hill, Pa. www.riteaid.com	Retail								
AMERICAN GREETINGS CORP. Cleveland www.amgreetings.com	Retail					NA			
UNUM CORP. Portland, Maine www.unum.com	Insurance								
NEW YORK LIFE INSURANCE CO. New York www.newyorklife.com	Insurance								
MAPCO, INC.[000] Tulsa, Okla. www.mapcoinc.com	Oil/Gas Exploration							NA	NA
JOHN HANCOCK MUTUAL LIFE INSURANCE CO., Boston www.jhancock.com	Financial Services				NA	NA			NA
NORRELL CORP. Atlanta www.norrell.com	Professional Services								
PECO ENERGY CO. Philadelphia, PA www.peco.com	Utilities					NA			
TRANSATLANTIC HOLDINGS, INC. New York www.transre.com	Insurance								
BURLINGTON COAT FACTORY WAREHOUSE CORP., Burlington, N.J. www.coat.com	Apparel					NA			
STONE CONTAINER CORP. Chicago www.stonecontainer.com	Forest/Paper Products								
OWENS CORNING Toledo, Ohio www.owenscorning.com	Building Material/Glass				NA				
ESSEX GROUP, INC. Fort Wayne, Ind. www.essexgroup.com	Metal Products								
BARNETT BANKS, INC.[0000] Jacksonville, Fla. www.barnett.com	Banking					NA		NA	NA
ENTERGY CORP. New Orleans www.entergy.com	Utilities								
WISCONSIN ENERGY CORP. Milwaukee www.wisenergy.com	Utilities								
BANKBOSTON CORP. Boston www.bankboston.com	Banking								
AMP, INC. Harrisburg, Pa. www.amp.com	Electronics/Electrical								
HARSCO CORP. Camp Hill, Pa. www.harsco.com	Building Materials/ Metal Products								
TECO ENERGY, INC. Tampa, Fla. www.teco.net	Utilities								NA
FLEET FINANCIAL GROUP, INC. Boston www.fleet.com	Banking								
COMERICA, INC Detroit www.comerica.com	Financial Services								
COSTCO COS. Issaquah, Wash. www.pricecostco.com	Retail								
NORDSTROM, INC. Seattle www.nordstrom-pta.com	Retail								

Note: Charts represent a selection of the total criteria used to rank the overall Best Places list. Industry refers to primary line of business.

Reflections

"Last year, Avnet saw less than 2% of its IS staff turn over: 'We're very flexible here. We listen to our staff. We conduct quarterly surveys, offer flex hours and continue to make sure that their resumes are marketable.'"

Steve Bandrowczak
AVNET, INC.

IS ORGANIZATIONS AT IT-RELATED COMPANIES ARE GROWING AT ABOUT 16%, WHILE NON-IT COMPANIES EXPECT TO ADD ABOUT 13% TO THEIR IS RANKS.

"We do not have end users; we have business partners. . . . If we don't make this environment a better place to work, we are not going anywhere."

Joseph Smialowski
SEARS, ROEBUCK AND CO.

MORE THAN 75% OF THE BEST PLACES TO WORK COMPANIES SAY THEY ARE REWARDING IS STAFFERS WITH PERFORMANCE BONUSES FOR A JOB WELL DONE.

DISTANCE LEARNING

Do-it-yourself training anytime, anywhere helps make some Best Places even better

BY ELISABETH A. PARKER

Stock options, flex time, challenging work, unlimited Nerf toys and caffeinated beverages. . . . What more could an IS professional want from an employer?

How about distance learning?

This flexible training method, which lets people access training materials anytime, anywhere, is quickly emerging as a tool for attracting and keeping top information systems talent. Ten of this year's Best Places to Work are on the leading edge of a trend that is expected to catch fire in the next two years. By the year 2000, there will be a 13% compound annual growth rate for the amount companies spend on distance learning programs, predicts Judy Weller, an analyst at Gartner Group, Inc. in Stamford, Conn.

These programs will never replace live instructors, to be sure. But today's networking and communications technologies enable organizations to offer more training, while saving money on travel expenses and lost productivity time. Employees can access courses via networks to keep existing skills current and learn new ones from the comfort of their desktops.

Distance learning can combine videoconferencing, collaboration on the Web, instructor-led training via live video stream, computer-based training (CBT) and the ability to access stored videos on demand.

Networking leaders 3Com Corp. and Bay Networks, Inc. and business software developer Computer Associates International, Inc. use virtual private networks (also known as VPNs or intranets) to deliver courses and information to thousands of employees in locations around the world.

THE BEST IN DISTANCE LEARNING

- 3Com Corp.
- Avnet, Inc.
- Bay Networks, Inc.
- Computer Associates International, Inc.
- CBX Corp.
- Federal Express Corp.
- Harley-Davidson, Inc.
- KPMG Peat Marwick LLP
- Owens Corning
- Solectron Corp.

Source: Computerworld's 1998 Best Places survey

3Com's private Web site, 3Community, offers more than 70 Microsoft Corp. PowerPoint slideware courses, along with text-based information about the company, related technologies and more. Anyone can take courses and send questions and feedback to trainers via electronic mail. Plans are also under way to put streaming video on every desktop. "As recently as 18 months ago, IS people said you can't do it [due to technical limitations]," explains Bob Roman, director of business development. "But the Web forces people to think differently. Now you can share information in a more dynamic, real-time method."

With online video, everyone at 3Com can access high-quality training. The most talented presenters can deliver video lessons to users in real time. Videos can also be stored on the server for easy access. Because fewer people have to travel to provide or receive training, 3Com saves on travel costs. Meanwhile, employees can learn new skills with minimal disruption to their productivity and personal lives.

Bay Networks bases its training programs on Lexington, Mass.-based Centra Software, Inc.'s Symposium software. Bay Networks uses the Java-based application to conduct instructor-led, online classes in real time. Users can view slides, click a control to raise their hand and ask questions, talk via text chat and take quizzes as they would in a "real" classroom. "We can provide instantaneous training for 20 people at a time," says Steve Henry, director of education services for North America. Sending people to a four-day lecture class costs a minimum of $5,000 to $6,000 per person. In the long run, online training costs far less.

How do employees like these programs? In a recent corporate survey, they selected training as the No. 1 productivity improvement. Senior instructor Robert Macfarlane also reports that "employees appreciate being able to participate without having to travel. I have never heard a single person complain."

CA takes a variety of approaches to distance learning. The company offers more than 100 CBT courses covering hot technologies such as C++, networking, Unix, Java, Perl, HTML and Microsoft Certified System Engineer. In addition, CA offers weekly instructor-led courses on a variety of topics via satellite. "In this business, if you don't invest in your people, they stagnate and won't stay on," says Kevin Long, vice president of education services. "I feel strongly that this helps us keep our people."

Still, there are some types of training that are best taught the old-fashioned way, Garter Group's Weller says. Technologies that require motor skills, such as configuring and installing networking components to pass Bay Network's certification programs, still require on-site training with instructors.

PARKER IS A FREELANCE WRITER IN SAN FRANCISCO. SHE HAS WRITTEN SEVERAL BOOKS, INCLUDING THE HOTDOG PRO VISUAL QUICKSTART GUIDE (PEACHPIT PRESS), HOME PAGE IMPROVEMENT (IDG BOOKS), BUILD A WEB SITE IN A DAY (VENTANA) AND NETSCAPE COMMUNICATOR: A JUMPSTART TUTORIAL (CHARLES RIVER MEDIA).

BRIAN RASZKA

By Vahe Katros

Coming of Age

IN RETAIL, IS STAFFERS ARE ACHIEVING GREATER SOPHISTICATION AND GAINING STATUS

The retail industry has not always been a first choice among young IS professionals entering the field.

Historically, retailers' information systems departments have been notorious for their hodgepodge of proprietary systems and underfunded efforts to iron out data inconsistency and quality problems. All too often, the IS staffer is considered a second-class citizen.

Well, all that is finally changing. Today, some of the most energetic and innovative information technology work is taking place among retail IS departments. And retailers have begun attracting top guns from the consulting, manufacturing and financial services worlds. Retailers have come so far, in fact, that this year they occupy a whopping 12 out of 75 slots on the list of non-IT Best Places to Work — the third-highest number for any single vertical market segment.

How did this transformation occur? For Charles Mitchell, chief information officer at Seattle-based upscale department store retailer Nordstrom, Inc., the answer is simple: "We are in a period of tremendous innovation."

He isn't kidding. Thanks to recent technological advances, improvements in data warehouses, networking and portable systems and a boost from aggressive early adopters such as Wal-Mart Stores, Inc. and The Home Depot, Inc., IS people at some retail companies have taken on a new role. They are now sifting through terabytes of data and giving merchants and buyers strategic information, such as top-selling items by location and time of day.

IT's mission criticality has elevated the IS department to a leading role at Home Depot. Today, Home Depot is looking into store-based network computing and mobile applications and is using intranet applications to support its retail business mission. Most of these are activities "we wouldn't have been able to do five years ago," says Rixey Jones, director of application support, information services.

At the same time, retailers have received an influx of modern, open client/server systems from software firms such as JDA Software Group, Inc., Intrepid Technology, Inc. and, most recently, Germany's enterprise system powerhouse, SAP AG. These firms are all benefiting from the corporate introspection that was fueled by the need to address the Year 2000 issue. Thanks to these new systems, retailers are finding more well-funded and well-engineered products — a big change from just a few years back, when the retail software industry was characterized by boutique niche technology vendors.

Vicki Velt, director of corporate systems at Consolidated Stores Corp., the leading closeout retail company in the U.S., says when the started working in the industry 17 years ago, "we had to write everything ourselves." This included inventory management and merchandising systems. Today, she says, "you have a great choice."

But the many choices can be a double-edged sword. Technology is not the limiting factor, says Kent Podvin, senior vice president of information services at Rite Aid Corp. "Technology is changing faster than our ability to adopt the changes," he says. But that frees IS staffers to tackle more interesting tasks. "Retail is a science and an art, so our systems need to be designed to support this mix of objectivity and intuition."

Equally notable, the competitive retail environment has led companies to introduce products and offerings through new and existing channels. Take, for instance, the recent spin-off by Sears, Roebuck and Co. of its off-mall Great Indoors home center concept, or Costco Cos.' incorporation of an Eye Care center.

These developments, says Kevin Turner, vice president of application development at Wal-Mart, have created a new entrepreneurial retail culture. And his company is at the forefront.

THE BEST IN RETAILING

American Greetings Corp.
Burlington Coat Factory Warehouse Corp.
Circuit City Stores, Inc.
Consolidated Stores Corp.
Costco Cos.
Harley-Davidson, Inc.
The Home Depot, Inc.
Lands' End, Inc.
Nordstrom, Inc.
Rite Aid Corp.
Sears, Roebuck and Co.
Wal-Mart Stores, Inc.

Source: Computerworld's 1998 Best Places survey

BREAKING THE MOLD

Wal-Mart's innovations include the use of cross-docking at its distribution centers. With cross-docking, inventory arrives by truck from vendors and is immediately transferred to trucks bound for the store. Wal-Mart wielded its power early and often to drive the inventory management standards and processes needed to support a high-velocity inventory pipeline. Alan Greenspan has gone as far as to say that these initiatives have had a direct relationship to a lower consumer price index.

"Our industry breeds technology leadership," Turner says. "Every one of my competitors does some things better than us, so we always have room to improve." That quest for improvement has enabled Wal-Mart to attract "kids" who, in years past, would probably have chosen to work in the high-tech sector. Unlike other industries, where projects can drag on for years, "in retail you can win on a project every day," he says. "My projects last no longer than three months, which makes it easy for IS people to see the fruits of their efforts.

As today's retail IS people help their companies solve business problems, they are achieving greater sophistication. And with that new role comes a higher status.

Jones says she remembers a recent brainstorming session in which members of the IS staff were talking about moving some of the company's MVS systems to a Java front end. When the left the meeting, she says, she was as "pumped up" as she could ever remember being. "But it wasn't about the technology," she explains. "It was the excitement over the brain power and the quality of the discussion in that room."

Indeed, the message from this year's Best Places list is unanimous: Retailers can no longer be discounted.

KATROS IS A RETAIL INDUSTRY CONSULTANT AND ANALYST, AS WELL AS ADVANCED TECHNOLOGY EDITOR OF THE "RETAIL SYSTEMS ALERT" NEWSLETTER. HE CAN BE REACHED AT VAHE@WORLD.STD.COM.

BY MELANIE DECAROLIS

The Sky is the Limit

FAST PACE AND INTENSE PRESSURE MEANS FINANCIAL SERVICES INDUSTRY WILL PAY WELL FOR THE BEST AND BRIGHTEST

Roaring stock markets and a healthy economy have created a booming financial services industry that continues to be a fertile environment for high-caliber IT professionals at all levels. In fact, this year financial services companies made up one-third of those on the list of non-IT Best Places to Work.

Trading is moving out of the pits and into the bits. Technology advances such as program trading, Internet-based brokerages and the continuing explosion of cross-border financial transactions have made information technology professionals even more critical to financial institutions' chances of survival in a market that grows more competitive by the day.

It was the industry's need for rapid response that, in part, persuaded Paul Fusco to leave a 13-year career in the entertainment industry to become vice president for IT at insurer Metropolitan Life Insurance Co. "I was looking for a place where I could have a lot of impact in a short period of time," he says.

From the banks that developed automated teller machines to brokerages that virtually pioneered data mining and relational database technology, "financial services was one of the first industries to embrace IT as a strategic business objective," says Greg Scileppi, executive director of RHI Consulting, a Menlo Park, Calif.-based executive recruitment firm. The industry also beats others when it comes to salaries, he adds.

It stands to reason. The need to develop applications at lightning speed under intense pressure creates heavy demands on IT professionals, says Jeffrey Leon, managing director at New York-based executive recruiter Russell Reynolds. "[Business takes place] around the clock, not just around the world. If the information's not there, you can lose billions in a few minutes." This means financial services companies strive to hire only the best and brightest, who in turn are compensated accordingly.

MetLife has recently offered retention bonuses of 25% to IT employees who stay through April 2000. Continuity is important as the IT crew overhauls its infrastructure to get the insurer's 26,000 U.S. employees on common workstations as well as on Lotus Notes to streamline support and facilitate companywide communication, Fusco says.

THE BEST IN FINANCIAL SERVICES

- The Allstate Corp.
- American Family Insurance Group
- BankBoston Corp.
- Barnett Banks, Inc.
- The Chase Manhattan Corp.
- Cincinnati Financial Corp.
- Comerica, Inc.
- Fannie Mae
- First Chicago NBD Corp.
- Fleet Financial Group, Inc.
- John Hancock Mutual Life Insurance Co.
- Mercantile Bancorp, Inc.
- Metropolitan Life Insurance Co.
- The Minnesota Mutual Life Insurance Co.
- New York Life Insurance Co.
- The Principal Financial Group
- The Progressive Corp.
- ReliaStar Financial Corp.
- The St. Paul Cos.
- Student Loan Marketing Association
- Transamerica Corp.
- Transatlantic Holdings, Inc.
- UNUM Corp.
- USAA

Source: Computerworld's 1998 Best Places survey

BEWARE OF MERGERS

There is one potential drawback to the industry: the threat of mergers or acquisitions, which are somewhat rampant. So far this year, the financial services industry has faced more mergers than any other industry, according to Securities Data Co. in Newark, N.J. "If I was to put my programmer's hat back on, that's what I'd fear," says Eric Mauer, director of applications development at Comerica, Inc.

Yet fear of mergers and acquisitions doesn't strike an ominous chord with other IS staffers at financial institutions. Despite a recent merger with National Bank of Detroit, First Chicago NBD Corp., headquartered in Chicago, "did not lay off any IT professionals because there was so much work that needed to be done," according to Judy Martin-Mitchell, senior vice president of architecture and planning, who has worked in IT at First Chicago for 25 years. Year 2000 and the current installation of an enterprisewide database administration system are primary issues at the 33,000-employee bank.

If anyone is considered crucial, it's IT professionals, says Elizabeth Silvestri, senior vice president at Chase Technology Solutions, the transaction processing business division of New York-based The Chase Manhattan Corp. Although 69,000-employee Chase has seen two recent transactions on the mergers and acquisitions front, neither resulted in IS layoffs. "IT professionals have definitely seen they are a vital part of any merger," she says. "Every possible institution has systems that need to be worked on" and integrated.

Some IS staffers at financial institutions are even making inroads into the executive suite — a situation that would have been unheard of a few years ago. At MetLife, "there are a couple of instances where vice presidents [of IT] have moved over as senior vice presidents to the operating side of the business," Fusco says, adding that MetLife's president was the former chief information officer at PaineWebber Group, Inc.

At Chase, too, "I very definitely see that happening," Silvestri says. "Technical people have to understand the business side to help develop solutions. Businesspeople have to understand the technical side to help run the business profitably. The two are not silos." If you doubt her words, look no further than Chief Operating Officer Denis O'Leary: He was once the CIO.

DECAROLIS IS A FREELANCE WRITER WHO LIVES IN BROOKLINE, MASS.

IN THE MONEY

Financial services companies offer top-of-the-line pay but bottom-of-the-barrel benefits

1997 COMPENSATION

Average percent increase in compensation:

Financial Services:	9.5%
Other industries:	7.5%

Percentage of companies expected to increase compensation by more than 10%:

Financial Services:	39%
Other industries:	35%

1996 ATTRITION

Average rate of IT personnel turnover:

Financial Services:	5.5%
Other industries:	8.5%

1997 HIRING

Average number of IT workers who joined each company:

Financial Services:	200
Other industries:	155

1997 TRAINING

Average number of days of training provided:

Financial Services:	10 (a 12.5% increase)
Other industries:	12

Training costs per IT pro: $1K-$15K (average $2,800)

BENEFITS: Nearly all of the financial services companies on the list offer policies for at-home work and flexible hours. However, laptop PCs and other work/life support systems, such as company-subsidized or on-site child care, elder care and benefits for spousal equivalents, were the lowest-ranking benefits.

Note: 1997 figures are estimates based on first 11 months of the year

ILLUSTRATIONS BY MARC MONGEAU

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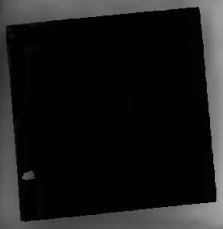

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Rewards, retraining and a carefully cultivated culture help Best Places keep their best employees from defecting

BY STEVE ALEXANDER

NO MORE Turnover

Retention is an uphill battle at a time when IS departments are besieged by headhunters and contracting is more lucrative than full-time employment.

But companies that are among the Best Places to Work expect to hire more information systems people than they lose to turnover this year. Among their secrets for IS retention: better hours, deferred compensation, project-oriented bonuses and a sense of community in the IS department.

Mark Wiley is one person who worries about losing staffers to the allure of the consulting life. "I have employees who are being called on nights and weekends, while I have outside consultants who work from eight to five and don't worry about pressure," acknowledges the senior vice president of information services and technology at Bindley Western Drug Co., an Indianapolis-based wholesale pharmaceutical distributor. "The employees see that they have more stress for less money. So we are going to have to treat IS people extremely well for the next three to five years," he says.

LOWEST TURNOVER

- Avnet, Inc.
- Bindley Western Industries, Inc.
- Caterpillar, Inc.
- Continental Airlines, Inc.
- Costco Cos.
- Lands' End, Inc.
- The Lincoln Electric Co.
- Selectron Corp.
- Standard Commercial Corp.
- Transamerica Corp.

Source: Computerworld's 1990 Best Places survey

His idea of treating people well includes matching some outside job offers to keep staffers from leaving. It also means creating a family-like work atmosphere where people celebrate birthdays and anniversaries together. "We are not keeping up with pay as well as we would like to," he says, "but I tell people that they have a steady place to work, goals to achieve and they are part of a team." It seems to be working. At the time of this survey, Bindley's current turnover rate was only 5%.

Wiley says he also believes in protecting his IS family from some of the pressures that go along with trying to satisfy users who always seem to want solutions to their problems yesterday. "I try to buffer IS people from that stress, and I think it helps with retention," he says.

HIRE FROM WITHIN

Costco Cos. is taking a different approach. To promote company loyalty, the Bellevue, Wash.-based owner of wholesale membership warehouse stores recruits employees from other areas of the company to work in its IS department. Costco hopes the strategy will help attract — and keep — a third of the 30 new IS staffers it plans to hire this year, a 13% staff increase.

"A lot of our people . . . have worked for the company for years before joining the IS staff," says Paul Moulton, Costco's senior vice president of IS. "So they're not so tempted to leave for a consulting job after six months or a year." Another plus has been the company's growth, which has provided IS employees with career advancement opportunities.

While Moulton does have heart-to-heart talks with staffers who are considering offers from other companies, unlike Wiley he draws the line at matching the suitors' salary offers. To him it only makes sense. "If I said I had a job offer and then got a salary increase to stay," Moulton says, "I'd feel like the company had been tricking me and not paying me what they think I'm worth."

HARD WORK REWARDED

A unit of San Francisco-based Transamerica Corp. uses a couple of reward systems to keep its IS people from bolting. Last year it began offering bonuses for projects that are completed on time and within budget. "Rather than wait until the end of the year for a bonus, we give these project-oriented bonuses that pay as close as possible to the time of the achievement," says Pat Natale, vice president and chief information officer at Transamerica Distribution Finance, a Rolling Meadows, Ill., financing subsidiary of Transamerica Corp. that serves manufacturers, distributors and resellers.

Through a partnership with Transamerica Distribution's human resources department, the company is also experimenting with a package of bonuses and deferred compensation, the latter paid only if an IS person stays at least four years.

Why four years? "I think four years is the magic number for a new hire," Natale explains. "The company culture becomes ingrained in them, and they are more likely to stay." Of course, you also have to "give them work they like and that challenges them," Natale is quick to add. "Money is not enough. They can get money anywhere."

ALEXANDER IS A FREELANCE WRITER IN EDEN PRAIRIE, MINN.

STEIN EOKEN

STAYING Power

BY ALICE LAPLANTE

A LOOK AT JUST WHAT KEEPS PERENNIAL BEST PLACES TO WORK WINNERS ON TOP

Of the 100 companies *Computerworld* annually lauds as worthy of being dubbed the Best Places to Work in IS, a mere handful (just 15) have managed to remain on that list for four years running — some even five (see box at right).

How do companies prove their staying power? It's not rocket science. First, they recognize that information technology workers are particular about two things: keeping their technical skills absolutely current and achieving the right balance of work and personal life.

Second, they understand that retaining experienced workers while attracting new blood to the ranks is what makes an IT group valuable to a company.

"Our employees are our single most valuable resource," says Dennis Rygwalski, director of information systems at Fleet Financial Group, Inc. in Providence, R.I. "Providing them with the best working environment is a top priority."

Henry Fiallo also believes employee satisfaction is so critical to overall IT effectiveness that he ranks "quality of work life" as one of five critical success factors he's outlined for 1998 and beyond. Since Fiallo took the helm as chief information officer of New Orleans-based Entergy Corp. in December 1997, he's made a number of sweeping changes at the energy holding company that he hopes will meet his aggressive recruitment and retention goals.

Among other things, Fiallo has created six career tracks within IT. Although many companies have initiated a "two-track" option that allows IT workers to advance either as "personal contributors" or within the management hierarchy, Fiallo has pushed this concept further. He has subdivided the traditional management track into five options. For example, at Entergy an IT project management career requires different skills than a product management career, which Fiallo has defined as taking responsibility for a specific IT application. This is similar to how a software vendor would assign a manager to oversee keeping a commercial product competitive in terms of cost, functionality and upgrade path.

On the other hand, IT employees choosing an administrative career track will receive training and experience related to the resource- and financial-management aspects of IT. Fiallo says he believes a "market-driven" approach to IT careers is essential in an economic climate in which outsourcing is an increasingly attractive option.

"You need to pay attention to whether an external provider could do something better than you could. If you don't, you may find yourself outsourced," Fiallo says.

Other perennial winners also pay close attention to such matters.

Heavy equipment manufacturer Caterpillar, Inc. in Peoria, Ill., has created an IT-specific career development manager to keep valued employees from wandering. This confidential counseling service lets employees discuss career options and map out strategies that will help them grow without leaving the firm, says Jim Miller, manager of administrative services for corporate IT. "Even if it means leaving a current business unit, the counselor will help do what's best for the individual," he says.

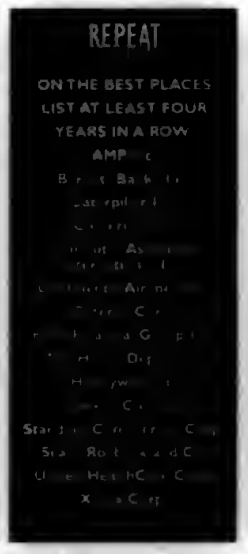
Not surprisingly most CIOs cited providing the opportunity to work on leading-edge technologies as the single most effective way to retain valued workers. "People working here demand — and get — the opportunity to work on global integration projects and world-class technologies," says Ron Vance, CIO of AMP, Inc. in Harrisburg, Pa. "That's a primary motivator."

About the rabid competition for experienced IT workers, "there are a lot of firms today who can pull out the checkbook and pay two or three times your employee's salary," says Diane Thom, human resources manager for IT at Comerica, Inc. in Auburn Hills, Mich. She points to Year 2000 contract work as an example. There's no way a corporate IT shop could pay what a Cobol programmer could get on the open market for a single project. Still, she insists a "holistic" strategy that takes culture, workplace dynamics, family issues, benefits and career opportunities into account can outweigh the deepest pockets.

For those companies in, let's say, geographically impaired locations, even more flexibility might be required. James Harrell is vice president of IS at Standard Commercial Corp. in Wilson, N.C. He runs a virtually flat organization: no programmer/analyst I or II, no project manager "or any of those kinds of titles," he says. Instead, an employee can act as programmer on one project and then manage the next one. "That way, our employees don't get pigeonholed," Harrell says.

"Anything I can do to keep them happy," he adds.

LAPLANTE IS A FREELANCE WRITER IN WOODSIDE, CALIF.



MICHAEL BACK

By Holly Hubbard Preston

COMPUTER GURU or CULTURAL ATTACHÉ?

TOP IS ORGANIZATIONS IN MULTINATIONAL COMPANIES ARE ASKING THEIR EXECUTIVES TO BE BOTH

THE OLD ADAGE SAYS YOU CAN'T please everyone all the time. But if you're an IS executive working at one of *Computerworld*'s top-ranked multinational companies, you'll at least need to try.

These days, information systems managers at far-flung organizations are being asked to wear two hats: computer guru and cultural attaché.

At Compaq Computer Corp., where non-U.S. sales make up more than half of the Houston-based computer maker's $24.6 billion in sales, the company is conscious of culture "all the time," says Chief Information Officer John White. Compaq's operations span six continents, which means its IS people must think about not just the projects they are deploying but also the people for whom they are deploying them.

Compaq has several enterprisewide network systems, including a SAP AG 3.1G-byte-based enterprise resource planning (ERP) system, that support multiple currencies, customs requirements and languages. It's imperative, White says, that the regional information technology managers, as well as their staffs, be able to troubleshoot with their overseas counterparts in mind.

But developing this mind-set requires extensive training. That's why Compaq offers awareness-building exercises and policies. In these courses, team members learn everything from etiquette basics, such as how to exchange business cards, to computer usage habits that vary by country to the varying amounts of screen space different international languages consume.

CRITICAL FACTOR

Federal Express Corp., another worldwide organization, treats multicultural awareness as a crucial element in IS planning and deployment. "Technology has real potential to be U.S.-centric," says Rob Carter, chief technology officer at FDX Corp., the Memphis-based holding company that owns FedEx. To overcome that obstacle, the $15 billion shipping giant has overhauled its approach to IS management and created separate IT subdivisions in every one of its four major geographic regions, each with its own CIO. Every quarter, the regional technology officers, along with Carter, meet for two or three days to discuss companywide IS initiatives and their impact at the worldwide and local levels.

These meetings, according to Carter, have been invaluable. They've taught FedEx to be more flexible in its worldwide network planning because some countries lag behind the U.S. in telecommunications infrastructure. Likewise, FedEx has learned to consider the cost burden that a U.S.-driven network initiative could place on some overseas subsidiaries responsible for their own bottom lines. The meetings also provide a constant reminder that not all countries have the same approach to using various technologies. In parts of Western Europe, for example, interactive voice response systems can be problematic because the idea of interacting with a telephone touch pad vs. a real person is still considered offensive.

The meetings consume approximately 12 days per year on the part of the company's top global IS executives, but Carter maintains they save the IS department big bucks over the long haul. FedEx, he says, no longer suffers from the false starts, failed initiatives and disparate systems it faced when the regional offices were taking direction from the U.S. office before having an opportunity for feedback.

STILL LEARNING

Not all of the companies on this year's Best Places to Work list have mastered the art of creating these cross-border feedback channels, however. One, which asked not to be named, is grappling with this issue now and having a tough time of it.

The company is integrating a customer service function previously performed by a U.S.-based system into a new, multiregional network and enlisted the help of a European integrator with experience deploying worldwide systems. But although the company spent months performing due diligence and preplanning, the project — slated to take nine months — is going on three years, with no end in sight.

The main problem? "We underestimated how great the cultural differences were between ourselves and our integration partner," says an MIS manager at the U.S. company. "Those differences were carried over into the software. We had different interpretations about privacy issues, usage, even look and feel."

While the company's European users felt comfortable with the software, its U.S.-based employees did not. Nothing on their screens looked familiar, nor could they execute the commands they needed. Only when the company took some of its U.S.-based employees to Europe to meet with the integrator's programmers could the problems be solved. Overall, the MIS manager says, it's been a valuable object lesson in just how big an issue culture can be.

HUBBARD PRESTON IS A FREELANCE WRITER IN PALO ALTO, CALIF., WHO SPECIALIZES IN COVERING INTERNATIONAL COMPUTER ISSUES.

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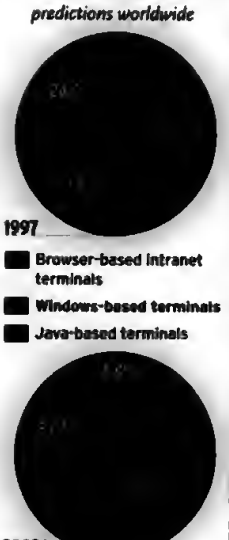
Briefs

[illegible] electronics, Inc. last week previewed an under-[illegible] notebook PC that features a 10.4-in. [illegible] screen, a 266-MHz Pentium processor and a keyboard that is 30% smaller than standard. The VAIO 505G is scheduled to ship in July at an estimated street price of [illegible].

[illegible] in South Korea City, S.C., has introduced a sub-[illegible] PC aimed at business users. The computer, called the Dasso 200, has a 200-MHz AMD Pentium, 32M bytes of RAM, a 15-in. monitor and a free Windows 98 upgrade. It costs $999.

Silicon Graphics, Inc. last week dropped prices across its line of desktop workstations and introduced new processors and graphics capabilities. The company said it will introduce its highest-end 250-MHz MIPS R10000 processor to its low-end O2 workstation line.

Thin-client market predictions worldwide



Source: In-Stat, Scottsdale, Ariz.

Handhelds help the help desk

▸ *Save time, money for mobile technicians*

By Kim Girard

HANDHELD DEVICES are saving the city of Palo Alto, Calif., money by making life easier for its help desk workers on the go. They cut down on paper use and the amount of running around the technicians do.

MOBILE COMPUTING

Help desk employees, who service 1,300 of the city's computer users, use handhelds — 3Com Corp. PalmPilots — to download trouble tickets from a central PC each morning and tote the information with them.

Throughout the day, technicians jot down how they solved a problem, and the PalmPilot's handwriting recognition software records the information, which eliminates report writing.

"It saves us an hour a day," said Napone Phommachakr, the city's IT support manager. "It's a godsend doing it with the PalmPilot. It saves us paper. We don't print out tickets."

The city invested $2,000 for seven 3Com Palm III devices and help desk software that Mountain View, Calif.-based Remedy Corp. adapted for the Palm Computing platform.

Remedy is testing the product with companies such as American Express Corp. and Eli Lilly and Co.

Phommachakr said Remedy's price appealed to him, considering that a help desk system he had discussed with another vendor would have cost up to $1n,000. He said actual savings from the system haven't been calculated, but it has already paid for itself in time and work saved.

Advantages of tracking trouble tickets with handheld computers:

- Cuts down on paper
- Curbs redundant trips to help desk station
- Provides immediate way to enter information on time/problem resolution
- Allows help desk staff to move easily among sites and take information with them

The concept of using a handheld as a help desk client is still new. Typically, use of the devices is limited to tracking contact names, phone numbers and schedules (see Executive Technology review, page 70).

Jack Gold, an analyst at Meta Group, Inc. in Stamford, Conn., said handheld use is quite limited within corporate help desks because the devices lack the hard drive or memory to carry a subset of data-intensive help desk applications.

"To move from [using a handheld as] a scheduler to a help desk client — that will take a year to two years," he said.

Handhelds, page 54

PERFORMANCE

New Intel chip may help NT

By Sharon Gaudin

INTEL CORP.'s upcoming Pentium II Xeon may help some users boost the performance of their Windows NT servers enough to keep them happy until NT 5.0 ships some time next year.

> With the new chip, we should be flying. It's going to be a quick machine.
> - Franklyn Athias, Comcast Cable

For nearly two and a half years, Microsoft has said Windows NT 5.0 will have much faster speed than previous versions and the ability to handle more processors. But there is no official release date in sight, so users don't expect any change until some time next year.

The Zeon chip, based on the Pentium II architecture, is expected to ship at the end of June. Zeon is an interim chip release meant to bridge the gap between Intel Corp.'s existing 32-bit Pentiums and the upcoming 64-bit Merced chip that is due next year.

It addresses 36 bits of memory at a time rather than 32 bits and will run at 400 MHz when it is introduced, according to sources close to Intel. That isn't as powerful as a 64-bit chip, but it still represents an exponential increase in power.

Zeon is aimed at workstations and servers and can scale up to four processors. In comparison, today's Pentium II processors scale to only two.

"The Pentium II Zeon chip will give a 40% to 50% improvement in performance for NT," said Joe Barkan, an analyst at Gartner Group, Inc. in Stamford, Conn. "This is going to

Intel chip, page 54

Smaller firms look for high-end stability

By Jaikumar Vijayan

THE GROWING POPULARITY of applications such as enterprise resource planning and electronic commerce is driving companies that before didn't fret too much about uptime toward systems that are available 24 hours a day, seven days a week.

IBM's RS/6000 High Availability Cluster Server – HA50

Base configuration: Two RS/6000 Enterprise Server H50s, IBM High Availability Cluster Multi-Processing for AIX, AIX software and one 7133 Model 020 Serial Disk System

Features: Up to four 604E 332-MHz PowerPC chips, up to 3G bytes of memory, up to 145.6G bytes of disk space and support for up to six external disk subsystems

Starting price: $78,200

IBM is the latest in a growing list of vendors trying to design packages that are simple and cost-effective enough for those applications. The company this week will introduce prepackaged clustered server configurations in its RS/6000 and AS/400 server lineups. Clustered servers let users increase application reliability by having one server back up another in case of hardware or software failure.

By prepackaging the hardware, software and middleware needed to put together such clusters, IBM "cut a lot of the development time, effort and complexity it would have otherwise taken us" to build a high-availability server configuration, said John Enright, director of technology at E.Spire Internet Services, an Internet service provider in Deerfield Beach, Fla.

The company is using a clus-

Smaller firms, page 54

Smaller firms seek high availability

CONTINUED FROM PAGE 53

tered RS/6000 configuration to keep its E-mail and World Wide Web hosting services continually available to more than 40,000 customers.

Those users represent the new breed that is looking for high-availability services, said Harvey Hindin, an analyst at D. H. Brown and Associates, Inc. in Port Chester, N.Y.

"It used to be that only airline companies, telecom companies or stock brokers needed [around-the-clock] system availability. But a lot of that is changing now," Hindin said.

United Airlines, for instance, uses a high-availability cluster of 25 IBM RS/6000 servers to ensure continuous uptime for a huge yield-management application.

Previously, these have been the only kind of areas that have required investment in high availability. But "today there are a bunch of applications, like E-mail for instance, that may not require much hardware horsepower but still require high availability," said Ajay Singh, manager of research and development at United in Elks Grove, Ill.

WHAT'S INCLUDED

IBM's RS/6000 HA50 clustered server package comes with two midrange RS/6000s, clustering software for AIX, redundant power supplies and hard disks.

The AS/400E high-availability server package has a similar configuration, but users can add high-availability versions of software such as Lotus Development Corp.'s Domino, the DB2 relational database management software and IBM's Net.Commerce electronic-business software.

On the Unix side, companies such as Digital Equipment Corp., Hewlett-Packard Co. and Sun Microsystems, Inc. offer high-availability configurations. Microsoft Corp. offers a package that runs on Windows NT servers.

But at a little more than $78,000 for an RS/6000 cluster configuration, IBM's packaged offerings compete well against similar offerings from other vendors, both on the Unix and Windows NT side, Hindin said. □

Handhelds help the help desk

CONTINUED FROM PAGE 53

noting that handhelds eventually will be robust enough to handle those applications.

The latest PalmPilot model, the $399 Palm III, has 2M bytes of memory. Other handhelds, such as Hewlett-Packard Co.'s new 620LX, which costs approximately $900, offer up to 16M bytes of RAM.

Roger Medsker, a senior computing consultant at the University of Iowa in Iowa City, said he hasn't considered handhelds. But he said the devices would offer greater flexibility to the 14 technicians who respond to data- and telephone-related help desk calls.

"Now, they carry paper with them," Medsker said. "It's difficult to get all the [work] they did on-site back on the system."

Handhelds would help ease that process, he said, but it would be difficult to get the crew to use them regularly.

MORE ON THE WAY

Besides the PalmPilot, which has cornered about 51% of the handheld market, help desk software may soon be available for other handheld computers including IBM's WorkPad and rugged handhelds from Symbol Technologies. □

Intel chip may help NT

CONTINUED FROM PAGE 53

solve a lot of problems."

All of that adds up to what industry observers expect to be an exponential improvement in performance. Actual performance will be tested once the chip hits the market.

Franklyn Athias, head of systems at Comcast Cable Corp. in Philadelphia, said his NT machines can handle the tasks he uses them for because they are dealing with only a few applications. But if his business grows at the rate he plans, Athias said he will need the power of a faster chip.

"I expect I'll have five or six additional services on NT," Athias said. "We may put telephony on there, so the more horsepower I have, the more people I can add onto that box and the more control I'll have. With the new chip, we should be flying. It's going to be a quick machine."

Brian Brumit, a director at Coopers & Lybrand LLP in New York, said NT isn't industrial-strength, but it does what he needs it to do. But computers are like cars — faster is better.

"Wouldn't you want a faster chip on your computer?" Brumit asked. "It's kind of the yin and yang. Software gets slow. Hardware comes out and makes things faster. Software adds more features, and hardware has to respond again." □

Senior writer April Jacobs contributed to this story.

MOREONLINE

@Computerworld links to information on chips and the semiconductor industry can be found under "Microprocessor and semiconductor industry links."
www.computerworld.com/more

SHORT

HP sued

Micro Solution, Inc. in Dekalb, Ill., has filed a suit alleging that Hewlett-Packard Co.'s CD-Writer Plus 7200E external CD-Rewriter infringes on its patented "parallel port interface mass-storage technology." The technology is used in Micro Solution's Backpack external storage products. A previous lawsuit against four vendors over the same patent ended last February with a settlement that required the defendants to cease shipment of infringing products.

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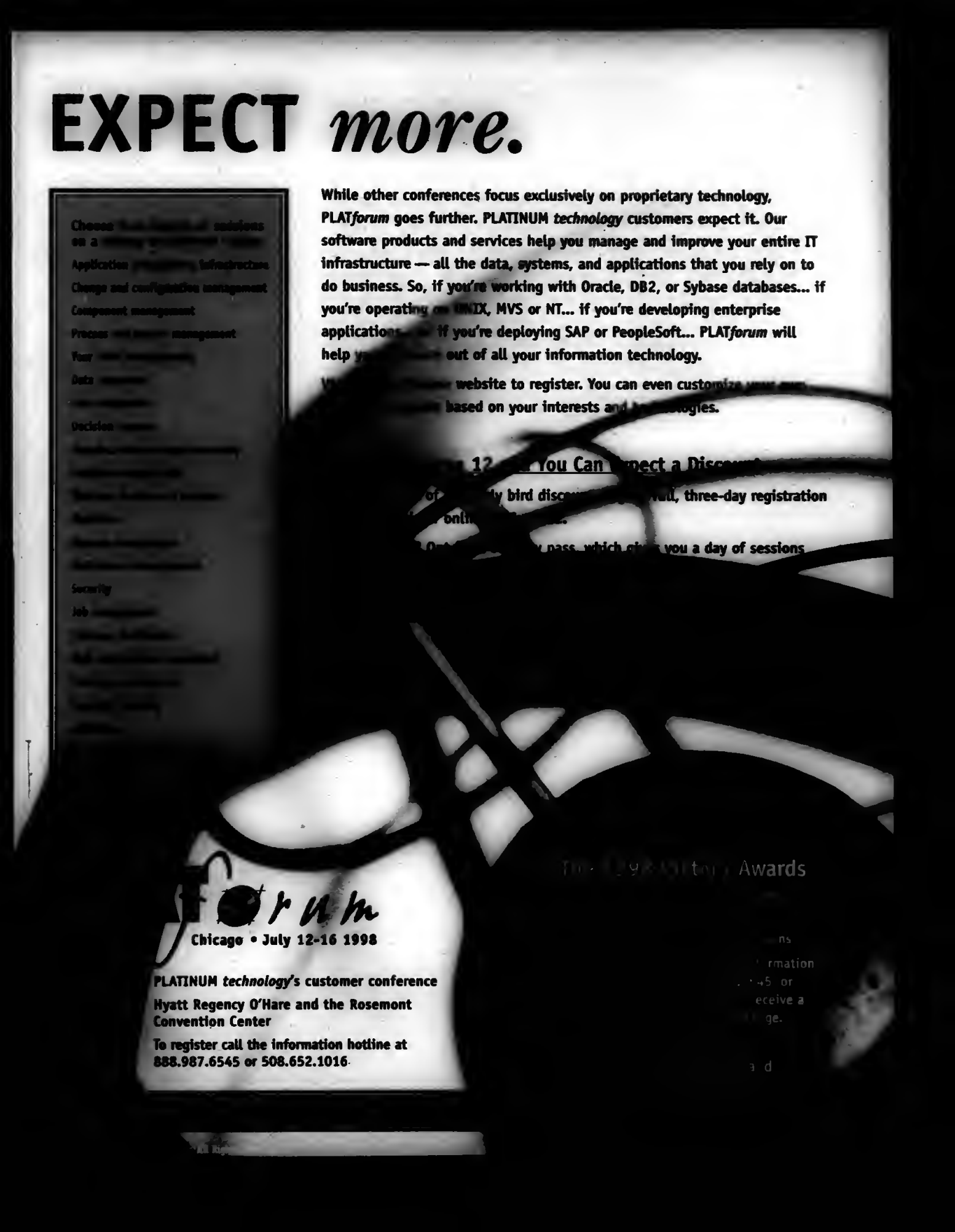

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Managing

HERE COME THE

The year 2000 legal posse is ready to ride. Who are they shooting for?

BY KATHLEEN MELYMUKA

POP QUIZ

What will year 2000 lawyers be doing over the next few years?

A. Helping you establish defensive policies to avoid lawsuits
B. Helping you sue technology vendors for compliance costs
C. Helping you sue technology vendors for year 2000 snafus
D. Defending technology vendors against your lawsuits
E. Helping you sue your suppliers for interrupting your business
F. Defending your suppliers against your lawsuits
G. Suing you for interrupting your customers' businesses
H. Defending you against your customers' lawsuits
I. Suing your insurance provider to pay year 2000 claims against you
J. Defending your insurance provider against your lawsuit
K. All of the above and much more

The answer, of course, is K.

WHAT WILL YEAR 2000 lawyers be doing over the next few years? Only a handful of lawsuits have been filed so far, but Gartner Group, Inc. analyst Lou Marcoccio estimates that more than 90% of U.S. law firms are looking to benefit from year 2000 litigation. Chances are that many of us will have run-ins with the year 2000 legal profession during the next few years. Corporate officers and boards of directors of public companies may be personally liable in class-action suits brought by stockholders (see "Frontier Justice" at right). IS directors, managers, year 2000 project directors — virtually anyone who works on the date-change problem — may find themselves subpoenaed as witnesses in litigation against their companies.

YEAR 2000

Here's a look at some of the early riders in that legal posse, where they're coming from, where they expect to go and who they're gunning for. Companies in almost every manufacturing, retail and service industry are so intimidated by the threat of year 2000 lawsuits that, 18 months before the date change, they've already made defensive strategies a booming subpractice in the legal profession.

KEEPING THE PEACE

Smith Helms Mulliss & Moore LLP, a Charlotte, N.C.-based law firm, has 185 attorneys. About a half-dozen are involved in year 2000 work, mostly helping technology users understand how to prevent being sued down the line. "Litigation is the breakdown of all rational business behavior. It should be the last resort," says Doug Ey, a partner at the firm. "Strange as it sounds, we are doing all we can to prevent litigation."

Lawyers don't need to litigate to get into the year 2000 action. At Goldberg, Kohn, Bell, Black, Rosenbloom & Moritz Ltd. in Chicago, for example, seven of the firm's 70 lawyers are looking at today's year 2000 issues, such as supply-chain management. They're helping clients write letters requesting compliance information and, more important, helping them respond to requests from others. Clients have to be careful about what such letters say, because the next time they see one of them, it may have an "Exhibit A" sticker on it.

Either admitting a system doesn't work or promising it will work may create problems, says partner Gerald Jenkins. "There may be no right answer," he says, "but properly presented, telling the truth isn't a bad way to go."

Goldberg Kohn also helps clients defray the cost of remediation efforts by inspecting software and hardware contracts to find out whether vendors or users are responsible for fixes.

The defensive market is developing even faster than some lawyers expected. "We thought of it as a loss leader to get our names out there so people would recognize us," says Greg Cirillo, a partner at Williams, Mullen, Christian & Dobbins, a 115-attorney firm in Richmond, Va. "What has surprised us is that it has become a bona fide practice."

On a given day, four Williams Mullen attorneys may be working full time on year 2000 cases, mostly auditing clients' year 2000 activities. "That's double what it was four months ago, and it could be double that six months from now," Cirillo says.

Creating a due diligence record is a concern for public companies, and the 600-attorney firm of LeBoeuf, Lamb, Greene & MacRae in New York, has been working with Fortune 500 clients on that since 1996. "We're practicing preventive law," says attorney Jeff Jinnett, who heads the year 2000 practice group of 25 lawyers. "Companies rely on us to review what they're doing and help them develop a project approach that we think matches best practices."

TIME TO 'FESS UP

Another hot issue for public companies today: the need for proper disclosure under securities regulations, says Paul Arne, a partner at Morris, Manning & Martin LLP, a 100-lawyer firm in Atlanta. The Securities and Exchange Commission requires that companies disclose specific information about year 2000 liabilities and plans, he says, and corporate officers who fail to live up to those requirements are liable to be sued.

The firms riding shotgun for ven-

LAWYERS!

dor clients say the big issue now is year 2000 fixes, which may be marketed as fixes (free) or upgrades (not free), with considerable legal consequences. "Think long and hard before you charge for that upgrade," says Dean Morehous, co-chair of the 24-lawyer year 2000 team at Thelen, Marrin, Johnson & Bridges LLP, a 240-attorney firm in San Francisco.

That advice stems from the year 2000 litigation filed to date. Three of the first four cases are class-action suits against software vendors (Symantec Corp., SBT Accounting Systems and Macola, Inc.) alleging that users are being asked to pay for year 2000 fixes. Those three suits are being brought with the assistance of Milberg Weiss Bershad Hynes & Lerach LLP, a New York firm with 110 lawyers that specializes in class-action suits.

"Our position is they are entitled to get those under warranty," says Salvatore Graziano, one of about 10 of the firm's lawyers working on year 2000 issues. "We are establishing ourselves as a firm that will sue for these issues."

Law firms representing technology vendors say their clients face many of the same issues nonvendors do. For example, Thelen Marrin is helping its publicly held clients present a single corporate view in the various reports that go out to regulators, stockholders and others. "A public company can have to make comments to dozens of constituencies," Morehous says. "We can help them to make sure the information going out to customers and suppliers is the same as what is going out to regulators — make sure they're all on the same page."

Gordon & Glickson PC is a 22-lawyer Chicago firm that specializes in technology law. It's conducting year 2000 audits, advising clients on contractual language and supply-chain issues, helping companies set up year 2000 task forces, creating contracts for year 2000 vendors and helping a few clients contemplate litigation.

But most year 2000 legal advice won't come from technology law firms or lawyers with technical expertise. Trial lawyers don't think that's necessary. "Trial lawyers are like sponges," Ey says. "They soak a lot up and then you squeeze them, and it should come out in a coherent story."

That's the attitude most firms seem to take. Year 2000 teams include lawyers who specialize in securities, commercial contracting, intellectual property, litigation, taxes, health care, banking and financial services, class action, insurance, corporate services, bankruptcy, environment, licensing, online commerce, public disclosure, labor and employment and technology.

Here come the lawyers, page 58

Frontier Justice

The year 2000 problem will bring up legal issues that have never been debated in court. Here are a few of the questions whose answers will set important precedents in year 2000 litigation:

IMPOSSIBILITY OR ACT OF GOD
If your business can't carry out contracted work because of a supplier's year 2000 problem, or a millennium problem for a supplier's supplier, will you be able to argue the "concept of impossibility" — that it was impossible to perform through no fault of your own — or even an Act of God? "If that happens, you're not liable," says one lawyer. To show impossibility, an important issue is whether you can show that you went to great lengths to try to be prepared. As for an Act of God, several states are considering legislation to declare it as a way to limit liability.

SOFTWARE LIFESPAN
Will software vendors get off the hook by arguing that a software product has a certain reasonable lifespan, and they aren't liable for fixes beyond that lifespan? For most products a reasonable lifespan is a matter of common sense, but software doesn't wear out.

FIX OR ENHANCEMENT
Is a product defective for not having year 2000 functionality, or is that an enhancement? Users will argue it's defective: The developer knew it would fail in 2000. Vendors will argue it isn't: The product worked when it was put on the market; besides, year 2000 function is an enhancement, and absence of an enhancement isn't a defect.

TIME FACTOR
How do you determine when it was reasonable for buyers to assume year 2000 compliance of products? In 1960: impractical, if not impossible. In 1975: unlikely. In 1990: reasonable for some products, such as mortgage management software that's expected to deal with dates 10 years away. But what about a word processor? In 2000: obviously. The trick is to determine when any piece of software should have had year 2000 functionality.

KNOWLEDGE AND LIABILITY
Have vendors always been responsible for specifically telling buyers a product isn't compliant, or are certain buyers sufficiently sophisticated to take responsibility for asking the questions? If the buyer is a mom-and-pop grocery store, the knowledge gap is huge, and common sense might indicate the greater burden is on the vendor to explain the issue. But when the buyer is a major IS department, the knowledge gap closes. Is the seller's responsibility the same to both buyers?

HERE COME THE LAWYERS!

CONTINUED FROM PAGE 57

"Obviously, we need to be educated about the peculiarities of this issue," says Rick Werder, a partner at Jones, Day, Reavis & Pogue in Cleveland. The firm's 1,200 lawyers include a year 2000 practice of about 35.

"But we don't see ourselves as year 2000 lawyers. We're people with a broad base of substantive experience in a particular discipline that they apply to a range of problems."

COME OUT SHOOTING

Once the calendar flips over to 2000, the peacemakers will become gunfighters, and a lot of year 2000 litigation will be about sharing the blame.

"We don't anticipate a lot of situations where we will be picking fights," Arne says, "but to the extent that any parties can share losses claimed, we will want to pursue those."

Ey says any one client may require him to act as both counsel to the defense and to the plaintiff. For example, a bank that supplies PC banking services may be a defendant if those services go belly up, but it may also bring claims against its own software vendors.

Another company may be sued and find that its insurance company isn't covering the damage. Then it could become a plaintiff in a suit against the insurance company.

"It will depend on what hat I'm wearing at the moment," Ey says.

But lawyers are used to such tangled webs of suits and countersuits. In fact, most lawyers seem to think that year 2000 won't be much different from any other litigation. There will just be more of it.

"The truth is the legal issues are not going to be rocket science," Cirillo says. "A couple of important legal issues will really decide how cases go. Other than that, it's straight old breach of contract."

Rocket science or not, year 2000 lawsuits will be at least a major pain in the neck to the information systems people who get sucked into them.

"Litigation is not fun," Arne says. "It forces you to focus on the past because you're trying to explain what happened rather than focusing on strategic objectives going forward."

Although a $10,000 lawsuit by a supplier would be far less devastating than a claim that a securities filing is materially false, any case that goes to trial is all-consuming, and lawsuits drag on, Ey says.

"People who have been involved will tell you it's a horror show," he says. □

Melymuka is Computerworld's senior editor, management.

MOREONLINE

More on this story and on the year 2000 problem can be found at (www.computerworld.com/more). To view our Year 2000 Resources page, scroll down to "Features" and click on "Year 2000."

YEAR 2000 SCOREBOARD

An occasional series on year 2000 trends, issues and statistics

Group urges sharing of embedded systems info

Year 2000 work on embedded systems is proceeding at a snail's pace, and the resources being allocated are inadequate, according to a coalition of more than a dozen grassroots year 2000 groups representing information technology managers around the country. The only way to avoid huge infrastructure problems around the world, they say, is for industries to jointly fund embedded systems research and share the information.

In a joint statement on embedded systems, the groups say that even organizations that have fixed their embedded systems are often dependent on other, similar businesses to fix theirs. And the dependencies can ruin the internal efforts if their partners haven't kept up. The problem is particularly prevalent in infrastructure industries such as telecommunications, water, natural gas, electric, sewage treatment and health care. Progress has been slowed because information isn't being shared. "We are spending precious dollars doing [redundant] embedded and third-party product research," the coalition says.

Another holdup: Disputes about who should pay for the fixes are prevalent, and companies seem more focused on resolving those matters than on remediation, the group says.

The coalition says a failure in any of the infrastructure industries could pose a serious threat to public safety, but it suggests that in some industries, as little as $10 million could fund the needed research, making it highly cost effective, if shared. If the research were shared with other countries, they add, it might be the most cost-effective foreign aid ever. — Kathleen Melymuka

Legal tidbits

Nothing beats good PR. The public relations value of good reporting to the Securities and Exchange Commission on year 2000 preparedness can't be overstated; worried stockholders can inflict far more damage than the problem itself.

"A public company might suffer, say, $100 million in [various year 2000] damages, but a Fortune 500 company could absorb that," says attorney Jeff Jinnett at LeBoeuf, Lamb, Greene & MacRae, a New York law firm. "But if shareholders start to panic and start selling their stock, the company might lose 10 points off its stock price, which could be worth hundreds of millions."

The perception problem can be greater than the reality, he says, so a good due diligence record and outside audits can be useful for reassuring shareholders, industry analysts, independent public accounts, regulators and your own board of directors.

The devil's in the *Dilbert*. An underappreciated danger in year 2000 is the juxtaposition of public disclosure and company E-mail because it presents opportunities for sabotage by unwitting corporate Dilberts, says Greg Cirillo, a partner at Williams, Mullen, Christian & Dobbins, a law firm in Richmond, Va.

Much year 2000 discussion occurs via E-mail, he says, and information systems people with a "Dilbert attitude" may say things that contradict the firm's statements. The person making the disclosures may be unaware of the E-mails, or the E-mails could be wrong. But that isn't the point. "Some aggressive lawyer just has to dig that up and put it next to the public record," Cirillo says.

— Kathleen Melymuka

THE FINGERS ARE READY TO POINT

If your organization experiences a year 2000 failure, don't be surprised if some executives engage in a "blame game."

Two surveys conducted in April by Howard A. Rubin, president of Rubin Systems, Inc. in Pound Ridge, N.Y., found that senior information technology professionals and senior business executives may tend to blame each other.

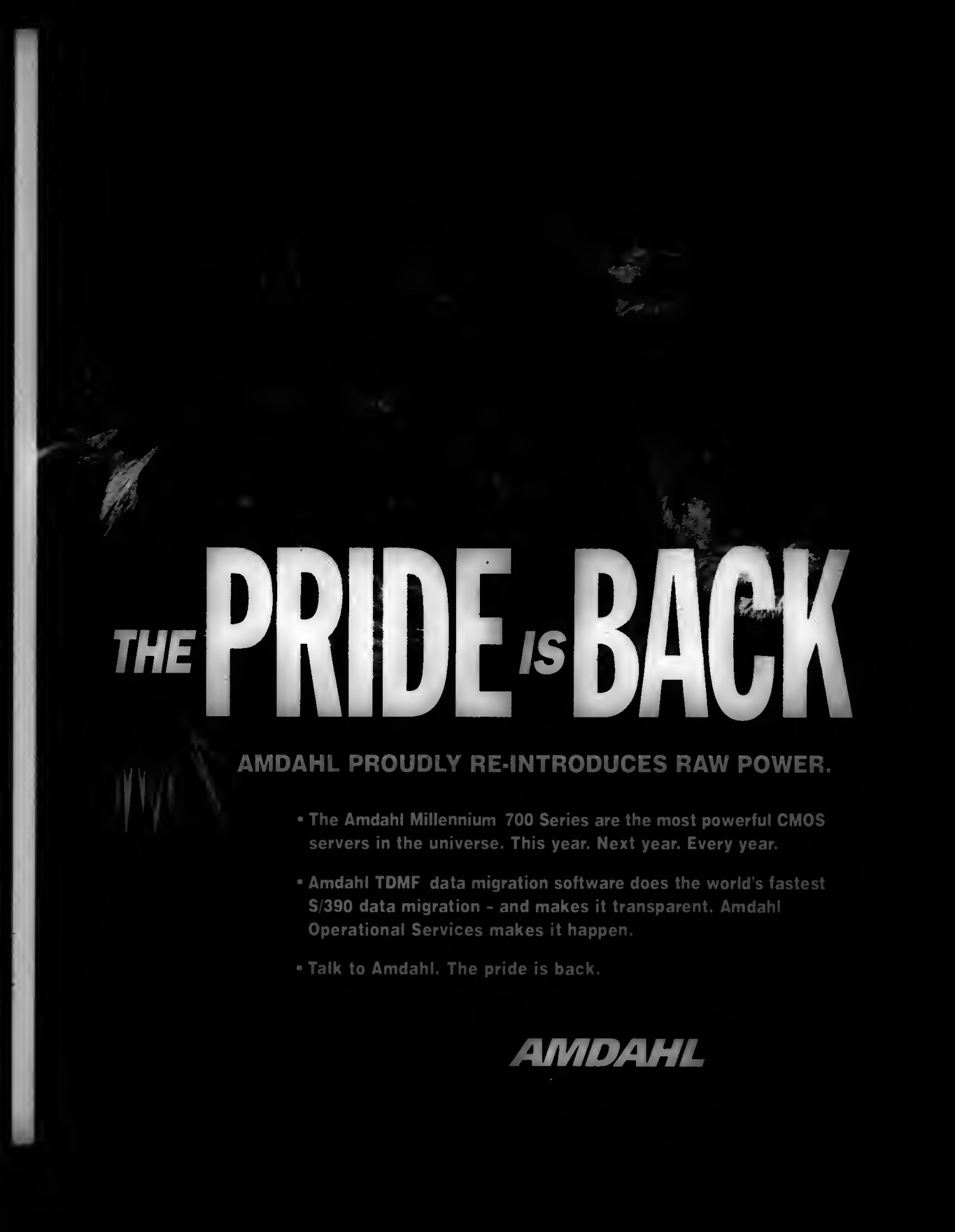
One hundred senior business executives and 120 senior IT professionals were asked: If problems arise within your organization as a result of the year 2000, who should be held accountable? Here's how they answered:

SENIOR IT PROFESSIONALS

Senior business management	62%
IT staff	24%
Software manufacturer	8%
Computer industry	3%
Hardware manufacturer	2%
Federal government	1%

SENIOR BUSINESS EXECUTIVES

IT staff	47%
Senior business management	38%
Software manufacturer	9%
Hardware manufacturer	3%
Computer industry	4%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• Talk to Amdahl. The pride is back.
AMDAHL

ED YOURDON

FIX-ON-FAILURE IS PLAYING WITH FIRE

The latest buzzword in the year 2000 industry is "fix-on-failure," a strategy of fixing year 2000 problems *after* they occur rather than trying to fix them *before* the Dec. 31, 1999, deadline.

Although such a strategy is better than nothing at all, it's like playing Russian roulette with bullets in five of the six chambers. In particular, it raises the possibility that a critical system may be deliberately allowed to fail, after which the IT "SWAT team" may find that the failure is irreparable.

The fix-on-failure concept isn't really new; it's just something we haven't talked about openly and explicitly. After all, many organizations have acknowledged that they won't have time to fix all of their systems, so they're using a triage strategy to focus attention and resources on their mission-critical systems.

WHITHER THE NONCRITICALS?

But as I pointed out in last month's column, that still leaves the question of what we're going to do with the noncritical systems. Shutting them down gracefully sometime before Dec. 31, 1999, is the most obvious option. That's quite different from the fix-on-failure approach, which involves continuing to run the systems after the Jan. 1 deadline.

Don't confuse fix-on-failure with the more familiar phrase "contingency planning." Contingency planning basically says, "We're going to try to fix the system, but we realize that we might run out of time, and we might have some bugs in the remediated systems. Just in case there's a problem, we better have a fallback plan."

But that's very different from the approach that says, "We know damn well that we're not going to have time to fix this system, so we're not even going to try. If it runs into trouble after Jan. 1, we'll fix it then."

For the noncritical PC applications — for example, an office PC used only for word processing — perhaps the fix-on-failure approach could be regarded as a relatively harmless strategy. But what about using a fix-on-failure strategy for the embedded systems in an electric utility plant?

Before you dismiss the idea as ridiculous, look at it from the perspective of the plant's senior managers, several of whom have admitted in off-the-record discussions that that is exactly what they plan to do. From their perspective, there isn't enough time or money to test the thousands of chips embedded throughout the plant.

A typical estimate for an exhaustive assessment of the year 2000 vulnerability of the embedded systems is two years and $20 million to $40 million. The failure rate on the chips is typically only a few per thousand, but you don't know which few chips are going to fail unless you test them all. The alternative is to wait for Jan. 1, 2000, and watch the failures unfold.

The optimistic hope, of course, is that when a failure does occur, it can be corrected quickly. One also has to hope that the failures will be isolated and that we won't have to cope with the compounded problems of multiple, simultaneous failures. For an organization with thousands of desktop PCs that run useful but noncritical applications, the user community can be advised, "Be on the lookout for problems after Jan. 1. If you have a problem with your PC, give us a call, and we'll replace it with a new one." But it's a dangerous strategy indeed if the year 2000 bug corrupts the organization's database or if it allows a process-control environment to run amok.

Thus, before the year 2000 project team announces, "We don't have time to assess this system, and we don't have time to fix it even if we discover that it has a year 2000 problem," it must assess the consequences of the failure.

Obviously, the situation could be quite serious for a process-control system, and we have to hope that the utility executives have thought carefully about the potential consequences of an embedded system failure: If the plant shuts down, how long will it take to bring it up again?

The same question must be faced in many business IT systems: Even if the database isn't corrupt, a year 2000 failure could make it impossible for employees to carry out their normal duties until the failure has been repaired.

Thus, the fix-on-failure strategy is heavily dependent on a skilled SWAT team armed with the proper tools (for example, replacement chips for embedded systems) that will stand ready to pounce on problems as they occur.

Meanwhile, what about your customers? Do they have a right to know that you've adopted a fix-on-failure strategy? Will they have the patience to wait while you fix your problems, or will they take their business to one of your competitors? And if they suffer a loss because of the (hopefully brief) disruption caused by your fix-on-failure strategy, will they sue you? Will you have a good defense when the opposing lawyer says, "Ladies and gentlemen of the jury, the defendants were worse than negligent: they *deliberately* decided not to even bother trying to fix their computer systems!"

If not, then you're playing with fire. □

Yourdon heads up the Year 2000 Advisory Service at Cutter Consortium in Arlington, Mass. His most recent book is Time Bomb 2000. *He can be reached via E-mail at ed@yourdon.com.*

f.y.i.

Refuge for the hassled IS leader

Sometimes an information systems manager just needs to chill out and get work done — and it has to be away from the office. "I have some big projects, and I can't ever work at home," says Bob Hughes, manager of information technology at Bayerische Hypotheken-und Wechsel Bank in New York. "I take my laptop to the library where nobody knows me, and no one will bother me."

When Eileen Strider was chief information officer at Universal Underwriters Group, she faced the same problem. Now she's offering a haven to other IS leaders in a service at the IT consulting firm of Strider & Cline in Kansas City, Mo. The service, called MiddleHaven, is a cross between a retreat and a management seminar with a little personal training and counseling thrown in. It all happens in the peaceful setting of a large, private house.

MiddleHaven offers a range of services for IS leaders struggling with projects, customers or co-workers, or just needing time-out to think. Clients can reserve a room for a few hours of private reflection or study, undisturbed conversation with colleagues or a one-on-one consultation with one of the firm's principals.

There are also scheduled miniseminars called "fireside chats" on topics such as "Creating Safety for Risk-Taking."

Launched on a trial basis last winter, MiddleHaven has been helping IT managers deal with work-related problems such as projects in trouble, trouble with an employee and too much work/too little focus. "This helped me become more focused on how to make my work situation less frustrating," one MiddleHaven visitor says.

— Kathleen Melymuka

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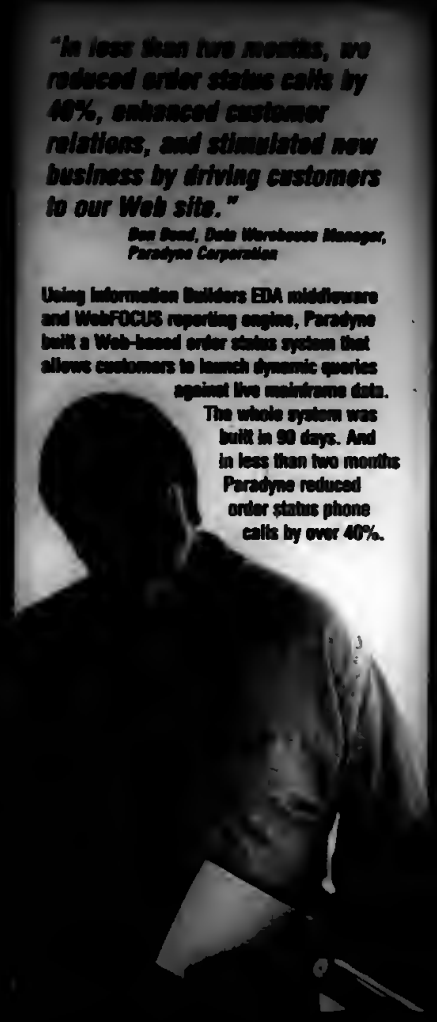

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MHz denotes microprocessor internal clock speed only; other factors may also affect application performance. ²Estimated reseller price to end users for model 8661-RMO (rack) and -TMO (tower). Certain features described on the right are available for an additional charge. Actual reseller prices may vary. ³Based on published TPC-C results of 11,078 tpmc as of 4/8/98. TPC and TPC-C are registered trademarks of Transaction Processing Performance Council. IBM product names are trademarks of International Business Machines Corporation. Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation. Intel Inside and Pentium are registered trademarks and MMX is a trademark of Intel Corporation. ©1998 IBM Corp. All rights reserved.

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Executive technology: What can handhelds do for you? Page 68

Review Center

Year 2000 tools

DON'T FORGET THAT DES

Year 2000 desktop tools will spot potential problems, but no product does it all

BY CHRIS DEVONEY

The year 2000 news is growing more ominous. Last month, the Federal Reserve Board estimated it would cost U.S. companies $50 billion to fix their year 2000 problems. Then, a Computer Intelligence study noted that almost half the information technology managers surveyed haven't taken any action to resolve desktop-based year 2000 problems.

Help is on the way. Two suites help find year 2000 problems on desktops and in the client/server food chain. I examined Survey and Assess, two packages that are part of Viasoft, Inc.'s OnMark 2000 line of tools. I also looked at Walker, Richard, Quinn, Inc.'s Express 2000 suite.

Each offering does an acceptable job solving one piece of the year 2000 puzzle. But no one product does all the work. Together, the OnMark tools and Express 2000 form a powerful planning and auditing team. Apart, each leaves significant gaps.

Additionally, the licensing cost per desktop (about $60 to $90 per seat for a 1,000-seat license) is high enough to make deployment on every desktop a hard sell. If you deploy the tools selectively, the single most important product may be Assess, which should be used on desktops that produce data from user-developed spreadsheets or databases that are distributed to others. That group includes users such as accountants, financial analysts and product and project managers whose information is dispersed to many people inside or outside the organization.

Reviews of the products follow: **Don't forget,** page 66

DON'T FORGET THAT DESK

CONTINUED FROM PAGE 65

SURVEY AND ASSESS

OVERALL GRADE C+

VIASOFT, INC.
(888) 842-7638
www.onmark.viasoft.com
$60/$95 per seat
($42.50/$64 @ 1000 users)

Viasoft offers a bevy of tools in its OnMark 2000 line. Several packages in the series are workbenches for macro writers or programmers who work with Microsoft Corp.'s Excel or Visual Basic, C/C++, Powersoft's PowerBuilder or Unix.

I worked with Survey and Assess. Survey's role is asset management, and it provides a complete inventory of the hardware and software on each PC on a network. Assess peers into the data files on workstations and servers, looking for year 2000 offenses.

Survey inventories clients that run Microsoft's Windows 3.1, Wiodows 95 or Windows NT; IBM's OS/2; or Unix on TCP/IP, NetBIOS, IPX/SPX or Advanced Program-to-Program Communications networks. Survey deposits the inventory information into a client-supplied relational database, such as IBM's DB2, Oracle Corp.'s Oracle or Microsoft's SQL Server. The management console and report software run on OS/2, Windows NT or an IBM MVS system.

Using Survey's inventory data, companies can compare their inventory list with vendor reports and quickly track which PCs are year 2000-compliant and which are running noncompliant software.

Although Survey recognizes many programs by file name, most corporations will have to devote several weeks of staff time to track down all software that the product flags. And Survey doesn't automatically identify which programs are year 2000-compliant.

Survey also lacks usage statistics. That means you can't tell how often a piece of software is used in the enterprise, and you can't use Survey alone to make an accurate year 2000 risk assessment.

OnMark 2000 Assess handles the complex task of analyzing individual data files on the workstation or server from spreadsheets, databases or text documents. Running on Windows 3.1, Windows 95 or Windows NT, Assess examines any text file or spreadsheet created in Excel, Lotus Development Corp.'s 1-2-3 or Imprise Corp.'s Quattro Pro, and databases in Clipper, Imprise's dBase III and IV and Paradox or Microsoft's Access and FoxPro.

Installed on a network server or workstation, Assess runs through the system's disks and looks for eligible files. For each problem file, Assess reports the specific problem (such as where four-digit dates are calculated but only two-digits are displayed); the exact row, record or cell number where the problem was found; and the number of problems spotted in the file, organized by severity.

Assess can make a copy of each potentially offending Excel spreadsheet, then color-code the offending cells, rows or columns according to the level of severity. Assess also contains a terminate-and-stay-resident program to correct PC BIOS and system clock problems.

Assess is somewhat expensive, costing about $60-plus per person in a 1,000-oser license. Assess is friendly enough that end users can use the tool themselves to identify year 2000 problems, although few users can fix all the problems they might find.

Given that PC-based data files, especially spreadsheets, often calculate and deliver important data used in business decision-making, Assess should be used on any desktop that produces that key data.

EXPRESS 2000

OVERALL GRADE C+

WALKER, RICHARD, QUINN, INC.
(206) 217-7100
www.wrq.com
$65 per seat
($53.74 @ 1,000 seats)

Seattle-based Walker, Richard, Quinn, most known for its Reflections connectivity software, offers an auditing tool in the form of its Express 2000 suite. The product builds on the capabilities of its Express Metering tool, included in the kit, to audit enterprise software use.

Express 2000 works with Windows-based machines. A scanning module, invoked from a log-in script or command line, inventories a computer's executables and can perform a BIOS and clock test for year 2000 hardware compliance. The scanning module sends its information to a server for holding in either an Access or Oracle database. The company plans support for other relational databases.

Express 2000 compares the scans with its database of more than 3,000 programs and their versions (opdated periodically over the Internet) for year 2000 compliance. The reports show the machines, the software and the compliance information.

A separate monitoring module from Express Meter also is pulled to every workstation via log-in script or command line. The module sends program use information to the server. Originally meant as a license-metering tool, the package identifies what programs are used, their frequency of use and length of use. That allows managers to perform triage and focus on heavily used programs.

Additionally, Express Meter can warn or bar users from running specific programs. For example, it can halt people from using programs with insufficient user licenses or those programs that aren't year 2000-compliant.

But Express 2000 is immature. As with Survey, it can take several weeks to identify all the software on all of an organization's machines. Entering the administrative information on the various programs that make up a suite, such as Word, Excel and Access for Microsoft Office, is slightly awkward. And you can't use the hardware compliance tests under Windows NT.

Even more annoying, the compliance and metering products aren't yet fully integrated. That means you keep separate databases for program inventory and program usage information. You also use separate management console programs to produce usage and compliance reports. Those problems should be solved in Version 4.0 of Express 2000, scheduled to be available later this year.

Of the packages I reviewed, Express 2000 is the better suite for taking inventory of a company's desktop and client/server software and for performing risk analysis for year 2000 compliance. But only Viasoft's Assess addresses data files. □

DeVoney is a reviewer in Seattle. He can be reached at chrisd@cybercritic.com.

YEAR 2000 DESKTOP PROBLEMS AT A GLANCE

The year 2000 problems a corporation will encounter with its PCs fit into three categories: hardware, packaged applications and custom applications, according to Kevin Knox, an analyst at Gartner Group, Inc. in Stamford, Conn.

Most desktop year 2000 hardware problems concern the machine's BIOS or the CMOS chip holding the real-time clock. Either the BIOS won't know how to flip the calendar from 1999 to 2000 or the CMOS can't hold four-digit dates.

Because PCs can get the correct date from the network, the year 2000 problem may fall hardest on standalone PCs that hold a database — anything from a telephone book to sales records — locally on their own disks and require accurate dates.

As a guideline, all desktops shipped before late 1996 are noncompliant. The first compliant systems came with 133- and 166-MHz Pentium chips. Most systems from the top-tier computer makers since that time are year 2000-compliant.

Knox endorses the idea of using suites that examine packaged applications, custom applications and their data files. Expect to collect a variety of year 2000 packages for different aspects.

Year 2000 plans should include a risk/benefit assessment. Given the time and cost involved in visiting each desktop to install patches, corrections or new versions, prioritizing problems is a must. The attention must go to high-priority applications, such as those used several thousand times a day. On the other hand, a package or spreadsheet that's used only four times a month or year might be ignored deliberately, Knox says.

— Chris DeVoney

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EXECUTIVE TECHNOLOGY

HANDHELDS

By Howard Millman

The increasingly popular handheld devices, typified by 3Com Corp.'s industry-leading Palm III, are ready to transform your telephone books, appointment calendars and memo pads into endangered species. At the very least, they can help you track appointments, organize contact information, record expenses and generally add order to your hectic life.

3Com's PalmPilot line, with more than 1 million users, has about 75% of the market. But new challenges are emerging. You can now select from competitive products offered by Philips Electronics N.V., Samsung Electronics America, Inc., Casio Computer Co., Everex Systems, Inc. and others. Those devices use Microsoft Corp.'s Windows CE 2.0, a scaled-back, yet still familiar, version of Windows. 3Com uses a proprietary operating system that can complicate sharing data with desktop computers unless the data is first translated into a basic format.

Data sharing is one of two critical elements you should evaluate before you buy a Palm III or a CE-based handheld. By leveraging their Windows heritage, CE-based devices ease data sharing by using scaled-back versions of full-grown Office 95 and Office 97 applications.

A color display, the second element you need to evaluate, is unavailable on the Palm III. Currently available on CE-based handheld computers from Compaq Computer Corp., Casio, Hewlett-Packard Co. and Sharp Electronics Corp., this display is easier to read than the coarser displays typically used in palm-size computers such as the Palm III.

I carried 3Com's Palm III and Sharp's new CE handheld, the Mobilon, on a recent trip to decide which was better. I preferred the Mobilon despite its higher cost and larger size primarily because its color display makes it easy to use in a variety of lighting conditions and because its built-in 33.6K bit/sec. modem eliminates the need for Palm III's $129 external modem. But if you intend to use a handheld primarily to retrieve data, take advantage of the Palm III's lower cost and smaller size.

Palm III
Palm Computing Division of 3Com Corp.
Mountain View, Calif.
(800) 881-7256
www.3com.com
PRICE $399

The Palm III's chief benefits are its convenient size and light weight. But even those benefits can't compensate for its dim 3-in. display. In my tests, reading the unit's coarse characters on a green background required near-optimal lighting. The unit's contrast control and backlighting improved visibility only slightly.

Getting data into the Palm III requires tapping individual characters on a tiny on-screen keyboard with the stylus. Alternately, you can enter text using Graffiti, a handwriting recognition software. Graffiti requires that you learn some new characters and symbols, and you must adhere to a special motion when entering a letter or number — a minor imposition. But writing on a screen with a stylus feels unnatural.

Mobilon HC-4500
Sharp Electronics Corp.
Mahwah, N.J.
(800) 237-4277
www.mobilon.com
PRICE: $999

You can do serious work with the Mobilon. Not a lot, mind you, but you can write a couple half-page memos, send faxes or compose multiple E-mail messages. You enter text into the Mobilon by poking at keys on its compact keyboard. To enter commands or activate menus, you lightly tap the touch-sensitive screen with a stylus. Thanks to its high-contrast, 6.5-in. color display, you can use the Mobilon in a taxi, a hotel room or an airport waiting room without squinting or contorting to catch the available light.

For all of the Mobilon's advantages over the Palm III, it falls short in a couple of areas. For example, it's about three times the size and weight of the Palm III and about twice the cost. So the Mobilon can fit into an oversized jacket pocket or purse, but expect it to bulge a bit. Also, the Mobilon's battery takes a hit driving its bright screen. The battery powered our unit for half a day, whereas the Palm's battery can last two or more weeks. □

Millman operates Data System Service Group LLC, a consultancy in Croton, N.Y. You can reach him at (914) 271-6883 or hmillman@ibm.net.

Coming your way

The longer you wait, the more products you will have to choose from. That's a mixed blessing.

Mike McGuire, a senior research analyst at Dataquest in San Jose, Calif., predicts that a new class of product, called companion notebooks, will soon challenge handheld devices.

Companion notebooks will offer 8- to 10-in. color screens, nearly full-size keyboards and solid-state storage. That makes them "a good choice for vertical markets and for professionals who don't need a lot of content when on the road," McGuire says.

What about the future of personal digital assistants? "They'll be around for a while," McGuire says.

McGuire also says the personal digital assistant's convenient size and light weight ensures that people will continue to use them as data-retrieval devices as well as companion notebooks.

— Howard Millman

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Worldwide Telecommunicat on

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In Depth

HOAX ON YOU

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Unbelievable, of course. As far as we know, CTH cells don't exist. Subliminal messages may or may not influence the unsuspecting — but not within the pages of *Computerworld* (again, as far as we know).

But Internet users routinely fall for similar admonitions: the

Hoax on you, page 73

FERGUSON & GATEWOOD

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HOAX ON YOU

CONTINUED FROM PAGE 71

urban legend of choice for the Digital Age, the virus hoax.

Virus hoaxes first surfaced on the Internet in 1988, according to the U.S. Department of Energy's Computer Incident Advisory Capability (CIAC) and have been inciting panic ever since — often in people who should know better.

Take, for example, the vice president of intellectual property at a major footwear manufacturer in the Northeast. Last December, he forwarded a virus hoax called Join the Crew to other top managers at his company.

Rosenberger says newcomers to the Web believe the stories of evil geniuses, see an alert and "think they have to forward it."

"WARNING," reads Join the Crew. "If you receive an E-mail titled 'Join the Crew,' DO NOT open it! It will erase EVERYTHING on your hard drive! Send this letter out to as many people as you can. This is a new virus that is not yet detectable."

By the time the information systems liaison in the footwear maker's legal department received the message, it had spread throughout the company — maybe faster than any real virus would have. "I thought, 'Oh no, how embarrassing,' " says the IS liaison, who requested anonymity. "There was no way [for the vice president] to gracefully bow out."

Join the Crew is a popular hoax; the IS liaison was already hip to it. The tip-off: Merely reading an E-mail message can't damage a PC hard drive. Downloading an attached executable file can unleash a virus, but eyeballing a message is harmless. Some IS folks don't catch the hint, however.

Rob Rosenberger, a security analyst at a Fortune 1,000 company in St. Louis and webmaster at the Computer Virus Myths Homepage (see resources list), says his compadres in the IS department were responsible for spreading two commonly transmitted virus hoaxes: Win a Holiday and Unable to Deliver, which use the same format as Join the Crew. In each case, about 200 employees — 10% of the company's users — flooded the firm's two-person security team with alarmed inquiries.

"It wasn't [end users] who passed the message, [it was] people working with Unix and NT boxes who know a little about viruses," Rosenberger says. "There are so many new people on the 'net who read about evil geniuses who spread viruses in a temper tantrum, and they believe it. So when they see an alert, they think they have to forward it."

GEOMETRIC PROGRESSION

A user sees a virus hoax and tells four friends about it. And they tell four friends, and they tell four friends, and before long — to borrow a line from the Bee Gees — someone's started a joke that's started the whole world crying.

About half the weekly calls to the help desk at the International Computer Security Association (ICSA, formerly NCSA) in Carlisle, Pa., are inquiries about hoax warnings, says Jonathan Wheat, a senior ICSA lab analyst who helms the help desk and maintains the company's virus hoax page. The callers are a mix of end users and IS professionals.

Wheat says the worst calls come from computer hypochondriacs: people who read a hoax warning and become adamantly convinced they have a virus. "They read the message, and later their system is crashing," Wheat says. "It's really psychosomatic: They hear about the illness, then they get the symptom."

Like all the best lies, virus hoaxes that work tend to contain a grain of truth — just enough to sound plausible. They're also peppered with technical jargon. Consider the recent Bill Gates hoax, which spread so far it finally elicited a response from the man himself and in March was posted to Microsoft Corp.'s World Wide Web site (*www.microsoft.com/BillGates/BillGates_L/COLUMN/1998Essay/3-25col.htm*).

The Gates hoax began last November as a bogus chain letter (a whole other annoying E-mail burden) that offered recipients $1,000 and a free copy of Windows 98 for forwarding the message "if it reaches 1,000 people." Within the E-mail, it said, was an "E-mail tracing program that tracks everyone to whom this message is forwarded to. It does this through an [sic] unique IP address logbook database. We are experimenting with this and need your help."

The chain letter evolved into a virus hoax a few weeks later when an enlightened recipient sent out a follow-up message requesting users' credit-card numbers, supposedly in order to rush them their $1,000. The $1,000 wasn't compensation for forwarding the original chain letter, the E-mail said, but for pain and suffering because the original message held an embedded virus program.

Other recent hoaxes include Budweiser Frogs Screen Saver, the AOL Cookie Virus, PenPal Greetings, Good Times, Irina and the Death Ray Virus.

SLOWDOWN

Wheat says hoaxes seem to be subsiding somewhat. The ICSA didn't get its customary rash of calls on this year's two consecutive Friday the 13ths (in February and March) or on April Fool's Day. Those are the days usually favored by hoaxers. Generally, Wheat says, virus hoaxes peak in January following the holiday surge in home PC purchases, when vast numbers of users make their first forays onto the Web.

As the hoaxes make their way from the mailboxes of home users to their friends and loved ones behind corporate firewalls, the incidents get out of control because "IS security is often the last to know," Wheat says. Why? "Users are nervous because they think they have a virus, and they don't want to be in trouble," he says.

Embarrassment may be the biggest consequence for users who spread the panic. But for IS, virus hoaxes mean a lot more than egg on the face: Fielding a call for help, sifting through E-mail, researching and calming users can easily add up to a day's work for each incident. "The larger the company, the more important this becomes," Rosenberger says. "Time is money. Resources are money. A hoax costs money."

On the upside, virus hoaxes have helped raise security awareness among end users, says Tony Samms, vice president of distributed computing security at SunTrust, a financial services firm in Atlanta. Over the past eight months, four or five hoaxes have circulated at SunTrust, including Good Times and the AOL Cookie Virus. Each generated 20 to 30 queries from users.

"We do use those incidents to create security awareness; users learn to invoke their virus software to check their system. It makes them aware that they're vulnerable, so it's actually good for us," Samms says. □

Goff is a freelance writer in New York.

Resources

Security specialists recommend that IS establish a formal paranoia policy to thwart virus panic among gullible end users. Stress that before users forward an E-mail alert to colleagues and higher-ups, they should send it to the help desk or the security team. Use the corporate intranet to explain the difference between real viruses and fakes, and provide links to Web sites that can set the record straight.

Following are some of the most informative independent sites:

CIAC Internet Hoaxes Page: *http://ciac.llnl.gov/ciac/CIACHoaxes.html*

Computer Virus Myths Homepage: *www.kumite.com/myths/*

ICSA Virus Myths Page: *www.icsa.net/services/consortia/alerthoax.htm*

The Truth About E-mail Viruses: *www.gerlitz.com/virushoax/*

Virus Hoax FAQ: *chetnews.simplenet.com/hoaxfaq.htm*

The following vendor sites also include virus hoax information:

Dr. Solomon's Software: *www.drsolomon.com*

Symantec Corp.: *www.symantec.com*

Network Associates, Inc.: *www.networkassociates.com*

IT Careers

EYES OF THE BEHOLDER

By Rochelle Garner

BLURRED VISION. FATIGUE. NECK AND BACK PAINS.

ALL SYMPTOMS OF WORKING AT COMPUTER MONITORS. ARE THE TOOLS OF YOUR TRADE ONE OF YOUR WORST ENEMIES?

MORE ONLINE

For additional material about this subject by Rochelle Garner, go to www.computerworld.com/m

My eyes ache as I write this at my computer monitor. I have trouble keeping the on-screen text from dancing an uncomfortable cha-cha as I type. When I look away, my eyes need time to readjust their focus. I have Computer Vision Syndrome (CVS).

Coined by the American Optometric Association in St. Louis, CVS is a catchall phrase for everything from eye strain to blurred vision, light sensitivity, headaches, fatigue and neck and back pains. The population at greatest risk: people who intensively use computers for two or more hours per day. (Can you say IT professional?)

"The eyes take the brunt of my computing experience, more than my hands," says Ken Schiff, a software designer who frequently spends 15 hours per day at the computer. For Schiff, money is no object when it comes to protecting his body against the rigors of computer use. But despite a custom-built office, special lights — even expensive trifocal eyeglass lenses — Schiff felt the burning effects of CVS.

Schiff isn't alone. The National Institute of Occupational Safety and Health estimates that 88% of those who work at computers three or more hours a day suffer from eye strain.

"I was having really bad headaches right behind the eyes that seemed to be getting worse the longer I sat at the computer," says Dale Carlson, a staff engineer at Mylex Corp. in Fremont, Calif. After months of migraine-strength headaches, Carlson had his eyes examined. The prescription: computer-specific glasses. Today, Carlson's headaches have disappeared. And that's typical with CVS symptoms, which studies suggest don't become permanent.

The problem is that staring at a computer screen is an incredibly demanding visual task. "One reason it's so demanding is that the image you are looking at is suspended in a box with a reflective front surface," says Dr. Gary Osias, an optometrist in San Lorenzo, Calif. "You know you can reach the front screen, but that's not where the image is — it's behind the screen."

"For many people, correcting one thing in their workspace makes all the difference — but that thing will be different for different people," Sheedy says. "And for many people, it's a shotgun approach that works."

TAKE AIM

Schiff opted for the shotgun method, transforming his Union City, Calif., office into an ergonomic palace. "I am a poster boy for what to do at home," he says. Schiff's chair is a throne of ergonomic adjustments, fitting his proportions like a fine Armani suit. Track lighting suffuses the office with soft, indirect light. His three monitors pamper the eyes with tiny dot pitch, sharp resolution and speedy refresh rates. The monitors are low, forcing him to cast his eyes down the requisite 20 degrees — the better to keep eyes blinking and moist.

But still his eyes bothered him. And then Schiff heard about special computer-specific glasses made by Prio Corp. in Portland, Ore. Like his trifocals, these are prescription glasses. What's different? The diagnostic tool clips onto existing diagnostic equipment in a doctor's exam room and simulates a computer monitor. While a patient looks at the PRIO tester, a doctor uses a retina scope to see where the patient actually focuses. Schiff says he now sees more comfortably.

His former problems highlight the salient point about eye care and computer use: Try everything you can think of to make yourself comfortable. Pull down the blinds, dim the lights, lower the monitor, sit up straight and tall. Because when the body follows the eyes, the eyes can take it down a road nobody should travel. □

Garner is a freelance writer in San Carlos, Calif.

For your viewing pleasure: Six tips for reducing eye strain

1. **GLARE.** While looking at the computer screen, use your hand to shield your eyes from any light sources in your room: lamps, windows, whatever. If you feel an immediate relaxation or soothing, you have a glare problem. Draw the blinds or wear a visor while working.

2. **LIGHT.** Ideally, ambient light should have the same perceived luminance as the monitor itself. Too many overhead lights? Try disconnecting a few.

3. **REFLECTION.** Can you see yourself in the monitor? Do your eyes feel better when you place a manila folder on top of the monitor to block reflections? If so, tape the folder to the top of the monitor, giving it that sporty visor look.

4. **MONITOR DISTANCE.** Ideally, the monitor should be placed 18 to 26 inches away from your eyes when you sit flush against the keyboard, your back against the chair.

5. **MONITOR HEIGHT.** Again, ideally, arrange the monitor so that the top line of on-screen text is at eye level. Placing a monitor too high exposes more of the eye, causing it to dry out.

6. And, oh yes, **DUST THE SCREEN.** Staring through the yuck that coats the monitor places extra stress on the eye.

(Source: Health and ergonomic professionals interviewed for this story.)

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SQL DBA Programmer/Analyst

Designs, develops and maintains client/server solutions to business needs. Also provides technical support. Requires 4+ years software development and C/C++ development experience. Knowledge of programming, debugging, database/system analysis and database programming is essential. Must be familiar with Word, Excel, Notes email, PowerPoint, Windows 95 and Windows NT.

CSA Engineer Level III

Maintains multiple MS SQL servers in a client/server environment, supports production systems and assists with development efforts. Requires 3-5 years experience including relational database administration, MS SQL server support and MS Windows NT support. Knowledge of SQL, VB and C++ required. Must have experience in c/s applications development and Compaq Server Class systems.

PowerBuilder Developer

Intermediate to advanced PowerBuilder developer 5.0 would be performing data retrieval in a datawindow, inheritance, user objects, script events, MDI and structures, with strong understanding and ability to write stored procedures. SQL Server experience preferred.

AS/400 Programmers & Analysts

Requires 3 years of RPG 400 and CL. Must have strong programming, analytical background and communication skills. Experience with word processor and other documentation tools required. Exposure to new technologies such as JAVA 400, Notes 400, EDI and web design. Knowledge of mortgage banking is highly preferred, coupled with exceptional analytical skills. Must be comfortable working with users and a large IT team that promotes new technology.

AS/400 Sr. Computer Operator

Requires 3-5 years in AS/400 operations in a multi-system environment and knowledge of IBM Operating Systems and CL programming.

Project Leader, AS/400 & Client Server

Requires 2-5 years experience in EDI implementations and project management including software. Knowledge of IBM AS/400 system, client server development and EDI standards and conventions is required. Excellent interpersonal and managerial skills are essential.

SQL Server DBA

Performs physical modification, database implementation and support structures on MS SQL Server running on Windows NT. Also conducts performance and tuning activities, provides database maintenance and makes recommendations for system improvements. Must be well versed in Windows NT servers/workstations, MS SQL Servers, VB, C++, LBMS Systems Engineer CASE tools and Lotus Notes. Requires 1-2 years experience in relational database administration and MS SQL Server support.

Systems Support Analyst

Requires a BA/BS degree in Business Administration, Accounting or Computer Science. Must be PC proficient (Word, Excel, Access). Excellent managerial and organizational skills are essential. Experience with AS/400 and relational databases a plus.

Database Administrator

Ideal candidate will have a BA/BS degree with experience in developing extracts, data warehouses, star schema design and query optimizations. NT Server and MS/SQL is required. Familiarity with AS/400 is a plus.

Administrator — Applications Compliance

Ensures the gathering of all application compliance information, Y2K compliancy of the application and compliancy with all appropriate network and development standards. Will gather detailed application usage and business impact information on all applications. Requires 2 years experience in an administrative position as well as knowledge of PC software, networking concepts and computer systems administration.

Internetwork Engineer

Coordinates business partner connectivity requirements, performs needs analysis and collects data. Also develops business flow and technical diagrams, plus communicates with peers on projects involving business groups, design committees and security audit. Designs and implements networking technologies and products, performs requirements analysis/design, selects components and performs troubleshooting. Must be familiar with network technologies, business automation methodologies and router, firewall and networking topologies.

Network Council Operator

Monitors activities related to operations of LANs and WANs. Diagnoses systems and equipment failure of devices for corrective actions. Requires 3+ years data processing experience including network operating systems, platforms and data communications.

Data Security Administrator

Administers controls for access to corporate information assets in compliance with existing policies/procedures. Works with AS/400 user community to ensure user access to systems and data. Will also delete unnecessary access to systems or data as needed. Requires knowledge of Word, Excel and PC operating environment. Must be a team player with excellent written/verbal communication skills.

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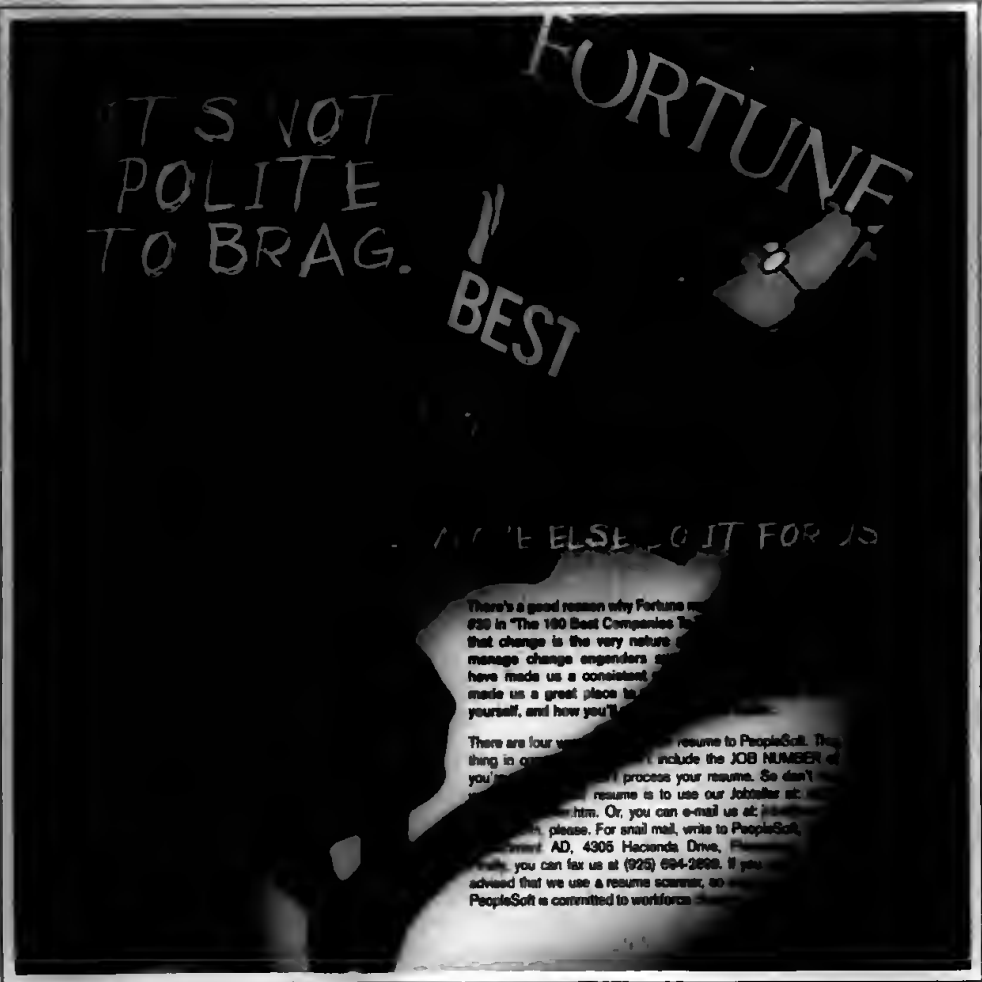

Software Engineer (Unix Networking/Sys. Admin. & Sys. Prog.): Install, configure & fine tune performance of operating sys. on heterogeneous platforms. Achieve connectivity of workstations using networking technologies. Perform sys. configuration support for both h'ware & s'ware. Provide user support & network trouble-shooting services. Carry out performance tuning of operation systems such as Solaris, HP-UX, AIX, etc. Perform network mgmt. using SNMP & related tools. Ensure fault tolerant printer services & back-up mgmt. procedures. Utilizing knowl. of installation of WAN connectivity software/process h'ware platforms using routers &/or gateways over leased & dial/wired circuits. Using knowl. of internals on operating sys. for porting & coding data drivers & network progm'g using IPX/PX, TLI, Streams & SOCKETS. Req: B.S. sci./comp. sci./engr'g/math (or equiv.) & 1 yr exp in job offered or as programmer/systems analyst. Must have appropriate combination of skills as follows: 1 of A & 2 of B or 1 of D; or 1 of A & 2 of B & 2 of C; or 1 of A & 2 of C & 2 of D as follows: A) Operating Sys.: SUN OS, HP-UX, Sun Solaris, DEC Open VMS/Ultrix, SCO Unix/ODT, UBL Unix; SVR4, UnixWare; B) LAN/WAN Connectivity/Networking Protocols: TCP/IP, IPX/SPX, NFS, Bridges, Routers, Gateways, X.25, X.400, ISDN, ATM; C) System/Network Progm'g: Perl, Korn, Shell, C Shell, RCP, TLI, Streams, SOCKETS, API & toolkits, DDK, AWK, SED, LEX, YACC; D) Networking tools: Ethernet, Token Ring, FDDI; high mobility preferred (multiple positions). 40 hrs/wk, $55,300-$65,000/yr. Reply/send resume to Vincent Mastrioh, Mgr., Iron Valley Job Ctr, 345 Fifth Ave., McKeesport, PA 15132. JO #3815245.

Software Engineer - Tandem Computers: Structured systems analysis, design, development, testing, implementation, integration, maintenance & support of complex massively parallel fault-tolerant online transaction processing & communications systems in the banking, finc'l, communications & other commercial environs. This involves working in a multi-h'ware/multi-s'ware environ based on the client-server model using both centralized & distributed Relational Database Systems w/Tandem NonStop SQL, Third Generation Languages, Communication Protocols & the full range of Tandem Software Utilities. Req: B.S. in sci./comp. sci./engr'g/math (or equiv); 1 yr exp. in job offered or 1 yr as programmer analyst/systems analyst. Must have appropriate combination of skills as follows: 2 of A and 2 of B; or 2 of A and 2 of C; or 2 of A and 1 of B and 1 of C as follows: A) Languages: TAL, C, C++, COBOL85, SCOBOL, TALC; B) OS, DDNS & Tools: Guardian/NonStop Kernel, NonStop SQL, ENSCRIBE, DDL, TMF, PATHWAY, SCF; C) Communications: X.25, X-400, SNAX, TCP/IP, RSC; high mobility preferred (multiple positions); 40 hrs/week; $55,300-$65,000/yr. Reply to: Charlene Cogley, Mgr., Beaver Falls Job Ctr., 2103 Ninth Ave., Beaver Falls, PA 15010, JO #7938161.

Senior Consultant - Automotive and Industrial Equipment: Combines analytic skills & management consulting capabilities to develop & help implement strategies for automobile manufacturers & other industrial products companies to improve their marketing, distribution & retailing effectiveness. Utilizing knowledge of market research information, conducts detailed quantitative analyses including competitive assessments of product quality, customer sales experience & post-sale customer service experience, & segmentation analysis of customer behavior & customer values. Conducts detailed analyses of supply chain structure & economics. Uses wide range of tools including SPSS, MTAB & Power Analyst software packages to study market research information and Excel for constructing economic models. Based on analysis conducted, develops management level strategy recommendations for clients supported by economic models & business cases which quantitatively assess the costs of implementing recommended strategy & outlines the impacts of the strategy on customer loyalty, customer service retention, market share, manufacturer revenue, dealer revenue, manufacturer profits, & dealer profits. Develops detailed written reports of analysis & strategy findings for presentations to senior management of client companies. Participates in the presentation of analysis & recommended strategy to senior management of client companies. Following approval of recommendations, works with members of client organization as implementation teams to implement strategy. 40 hrs/wk, 8am-6pm, $107,000 per year. Must have a Master's in Business or Public Policy and 1 year work experience in the position. Must travel within U.S. approximately 80% of the time. Send 2 resumes/ltr to: Case #71966, PO Box # 8968, Boston, MA 02114

Software Engineer - PC Networking/Sys. Admin. & Appl. Integration: Utilizing knowl. of networking topologies, networking technologies & PC architecture to: install, configure & manage physically distributed computer networks & network operating systems. Provide user support, network troubleshooting, network expansion, printer services & back-up mgmt. Coordinate local remote hardware & software configuration, deployment & execute operations procedures & monitor system resource utilization; perform capacity planning. Interface main application environ. w/underlying networking software. Carry out performance tuning of network for user applications. Req: B.S. in sci./comp. sci./engr'g/math or equiv. 1 yr exp in job offered or as programmer analyst/systems analyst. Must have appropriate combination of skills as follows: 2 of A & 2 of B & 1 of D; or 2 of A & 2 of B & 1 of C & 1 of D. A includes Operating Systems: Novell NetWare, Windows NT, OS/2, Windows 95, LAN Server, Banyan Vines, LANmanager, LANtastic.; B includes networking: IPX/SPX, TCP/IP, FTP, Windows for Workgroups, NetBIOS, X.25; C includes network mgmt: SNMP, LANanalyzer, NetView, NetManager; D includes LAN technologies: Ethernet, Token Ring, FDDI; high mobility preferred. (multiple positions) 40 hrs/wk, $55,300 - $65,000/yr. Resume/send resume to Pittsburgh West Job Center, Joan Lang, 339 Sheer Dr., Pittsburgh, PA 15205 JO #7938198.

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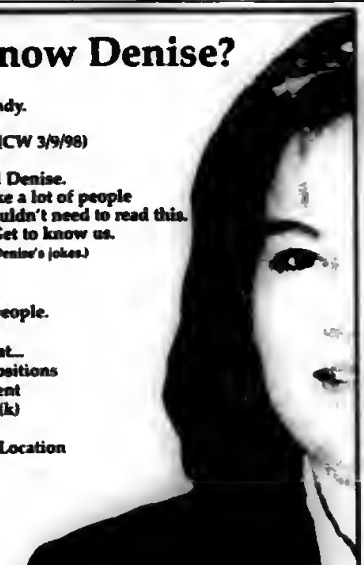

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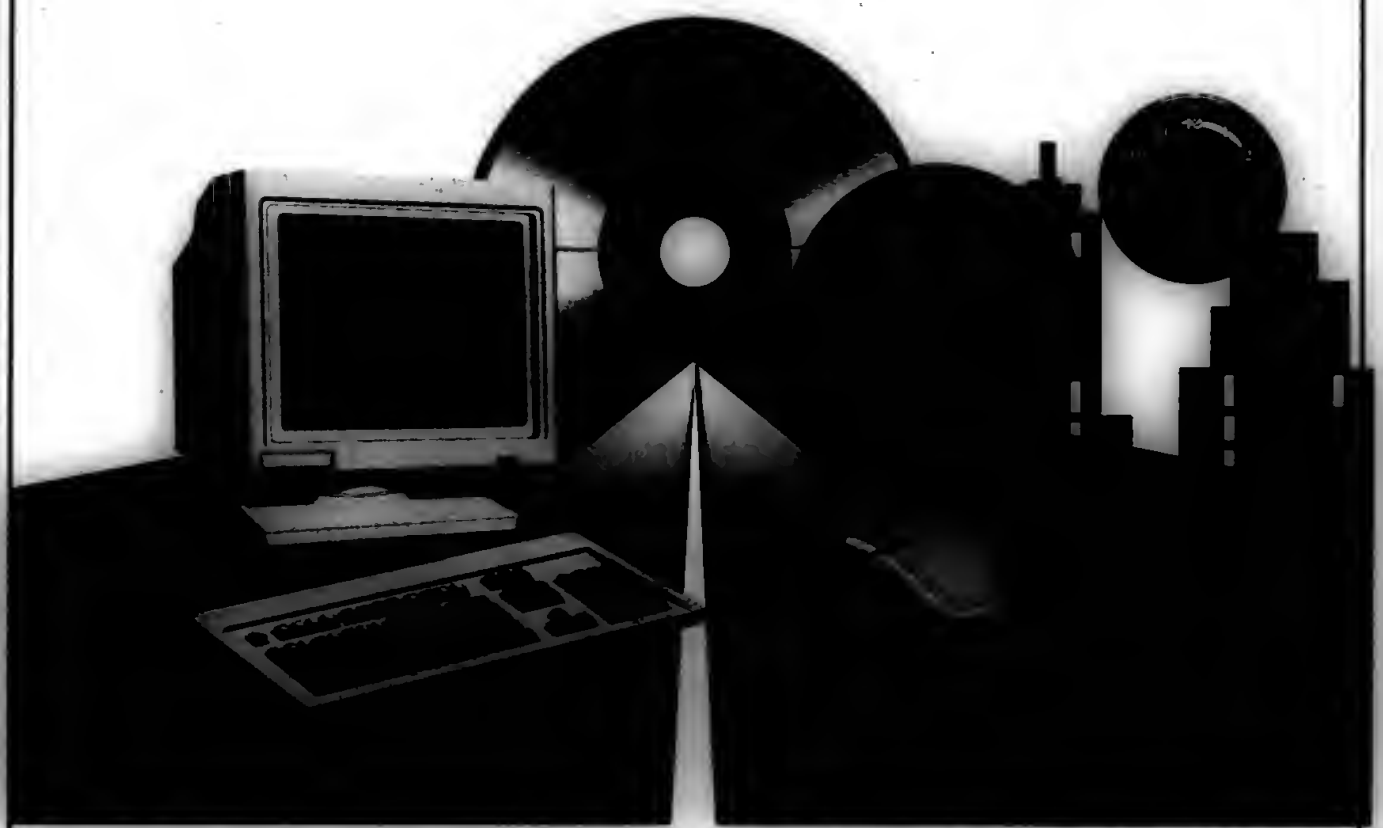

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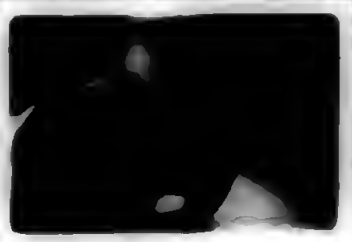

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PROGRAMMER II
AS 400 primary

PROGRAMMER II
Visual Basic primary

Programmer II - (AS/400 Position) A four-year degree in a computer related field and a minimum of 1 year programming in RPG III, RPG/400 or RPG ILE is required. Willingness to learn client/server and Visual Basic is important. A good understanding of SQL, DDS and related AS/400 and PC utilities is important. Successful candidates will be participating in the upgrade of our software system to operate both locally and in our field offices in six countries worldwide. The salary will be commensurate with experience but will be at least $36,600.

Programmer II - (Visual Basic Position) A four-year degree in a computer related field and a minimum of 1 year programming in Visual Basic and ODBC applications in a Client/Server environment is required. Willingness to learn AS/400, Clarion, and RPG is important. A good understanding of SQL, DDS and related AS/400 and PC utilities is important. Successful candidates will be working on distributed and remotely deployed applications on Windows95 PC's, data collectors and the AS/400. The salary will be commensurate with experience but will be at least $36,600.

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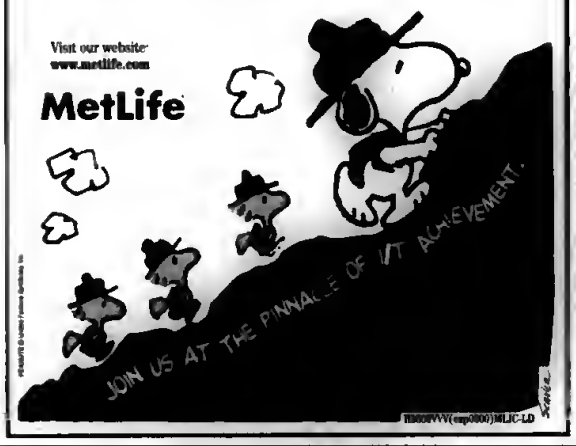

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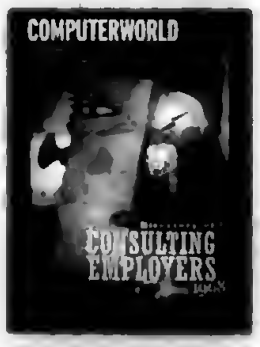

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SENIOR SOFTWARE ENGINEER - 40 hr/wk., 8AM-5PM, $65,000/yr., Located in Orlando, FL. Requires M.S. Degree in Computer Sc./related field & 3yrs exp in job offered or 3 yrs as a Programmer, Programmer/Analyst, Systems Analyst, or Software Engineer. At least 1 yr exp. must be in a lead role utilizing tools described below. Alternatively, employer will accept B.S. in Computer Sc./related field & 5yrs progressive exp as follows: 2yrs exp. in Software Engineering/ Systems Analysis and/or Programming; 1yr. exp. in a lead role in research, design & development of large, complex industrial, scientific and business applications utilizing tools described below; 1yr exp. in migrating large volume application systems on multi-hardware/software environments and 1yr exp in developing & directing software testing procedures. Perform a lead role in the research, design & development of industrial, manufacturing, & financial software systems & applications including on-site user research, identification, analysis, design, development & implementation of ERP systems and data warehouse application systems using all of Oracle manufacturing & financial modules, principles of computer science, mathematical analysis & modeling; research & advise on interfacing between hardware & software systems & migrate large volume applications systems on multi-hardware/software environments using a variety of migration & data conversion tools such as Smart DB/X Windows, EDMS, SQL, SQL Loader; develop & direct software testing procedures, programming & documentation. Customize applications to support business process re-engineering using Oracle AOL, PROC, PL/SQL & Oracle reports; perform database administration for RDBMS such as Oracle RDBMS including installation & configuration of complex database architectures; present proposals/advice for business re-engineering applications. Send resume to the Dept. of Labor/Workforce Program Support, 1320 Executive Center Drive, RM 127, Tallahassee, FL 32399, ATTN: S. CLARK, RE JOFL#1786068.

Programmer/Analyst - 40 hrs/wk., 8am-5pm, $45,000/yr., located in Orlando, FL, requires a B.A./B.S. in Computer Science/related field & 2yrs exp. in the job offered or 2yrs of experience as Systems Analyst or Software Engineer. Total 2yrs. exp. (or graduate course work towards Master's degree in Computer Science) in C, C++, Visual Basic, Netware tools, HP Broadband Series system & its related tools. Analyze, design, develop & test software applications per custom specifications. Technical environments utilized involve C/C++, Visual Basic, HTML, DCD D-Base, LISP, Chameleon for Windows, NEWT-SBK, NETWARE Tools, LAN/WAN, TCP/IP, SNMP, HP Open View, ATM, MPEG-2, VMS EVE, HP Broadband Series Test system, in UNIX, Win 3.1/95/NT, DOS, VMS. Work tasks & responsibilities include user interaction, requirements definition, project planning, high level design, program specifications, coding, unit & integration testing in the various stages of the software development process. Send resume to the Dept. of Labor/Workforce Program Support, 1320 Executive Center Drive, RM 127, Tallahassee, FL 32399, ATTN. S. Clark, Re: JOFL#1781004.

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SENIOR PROGRAMMER/ANALYST - B.S. Comp. Sci./Math/ Engrg. w/5 yrs. exper. as Sr. Programmer/Analyst or in Software Design & Development. Position req. exper. w/software development & implementation; strong background in AS/400, RPG, & COBOL; strong Math skills; knowledge of database conversion techniques; &, financial institution/application exper. is a plus. Analyze business req'mts., design, develop & implement complex software for client projects using AS/400, RPG, COBOL & CL. Apply year 2000 techniques & research & fix software bugs, test fixes & work w/customer support group to resolve reported bugs. Will be involved in entire project development cycle including design, development & system/unit testing. $57,500/yr. Job loc.: Longwood, FL & other FL client sites. Mail resume to: Pos. #3677, K. Grantham, COMSYS Technical Services, Inc., 2170 West State Rd., #434, Ste. 200, Longwood, FL 32779. No phone calls please.

PROGRAMMER (Job location: Tallahassee, FL) to design, develop, deploy and maintain client/server applications using tools such as PowerBuilder, APOL, Oracle, MS-Access, Visual FoxPro, Paradox, Lotus Notes, C/C++ to interact with Oracle or Alpha databases; use object oriented programming schems; use S-Designer, SQL and PL/SQL to design and maintain databases; design, develop and maintain web site using Netscape Netsite Communications Server, Visual FoxPro and Foxweb; participate in all facets of Joint Application Development (JAD) with clients; use Windows, Windows 95, Windows NT, UNIX, Banyan Vines. Require: B.S. in Computer Science and two years experience in the job offered. M.S. in Computer Science, with demonstrated ability to perform stated duties, may be substituted for B.S. and 2 years experience. Salary: $32,000 per year, 8 am to 5 pm, 40 hours/week, M-F. Mail resume to: FDLES Bureau of Operations, 1320 Executive Center Drive, Suite 110, Tallahassee, FL 32399-0667, Job Order Number FL-1744425.

Software Engineer III wanted to develop functional & design specs. & test plans for WAN products; design & develop software in C in accordance w/functional & design specs.; review software functional & design specs. for peer engineers; review, port & integrate 3rd party software products incl. ISDN, X.25 & Frame Relay; test & debug software; coord. w/Software Quality Assurance org. during product test cycle; provide tech. guidance to Sustaining Eng. org. for existing products which incl. Telenetworks ISDN Protocol software & Q.931/Q921 protocol software modules. Must have Master's degree in Elec. Eng. or Comp. Sci., 1 yr. ISDN Q.931/Q.921 exper. incl. exper. in porting protocol software, debugging WAN & LAN protocols w/protocol analyzer, & debugging w/ MC68000 assembler code, & at least 6 mos. exper. in X.25 Frame Relay, VxWorks Development Environment & VxWorks (exper. can be concurrent), & working knowl. of TCP/IP, PPP & IPX. Salary $59,450/yr. Send two (2) resumes to Case #71984, P.O. Box 8968, Boston, MA 02114.

ACCOUNT MANAGER. Responsibilities will include providing strategic Database Marketing consulting and day-to-day project management and understanding of industry and database marketing basics, billing, worksheets, monitoring of marketing associates, management of customer communications, data analysis, reporting/executive summaries and recommendations, submit cost estimates, presentation preparation, proposal drafting, lead special initiatives, estimate development, lead documentation of key client meetings, lead writing and development of creative briefs and lead in identifying target lists for program. Req'd: M.S. in Integrated/Database Marketing and 1 year experience in the job offered or in a related occupation as a Copywriter. 40 hrs/week, $55,000/year. 10 Positions available. Please submit resume to nearest Job Service office or mail to Job Service, 110 W. Main Street, Chapel Hill, Carrboro, NC 27510. Refer to Job Order #NC3100853 and DOT code 030.162-014. All resumes must include Social Security number.

Database Design Analyst. Senior position requiring exper. managing a develop. team. Expertise in data modeling & use of CASE tools, & in-depth experience of Client/server GUI develop. w/ PowerBuilder & Oracle and/or Informix. Will analyze/design/provide estimates for integrated database solutions to complex business problems utilizing PowerBuilder, Oracle, Informix, SQL, Project Management Software (e.g. Productivity Plus Methodology, PMW, Microsoft Project), CASE software (eg. ErWin, LBMS System Engineer), UNIX, Windows. Must be willing to relocate within the U.S. on a project-by-project basis. Must have Bach. Deg. or foreign degequiv. in Natural Science, Comp. Sci. or related & 5 yrs' work exper. in job offered or 8 yrs as Sys. Analyst, Software Developer, Programmer, or related. Hrs: 8a-5p, M-F. $58,400 per yr. Apply to Georgia Dept. of Labor, Job Order #GA6234815, 2943 N. Druid Hills Rd., Atlanta, GA 30329-3809 or the nearest Dept. of Labor Field Svc. Off.

Chief Computer Programmer Analyst sys. require's a member of Development Team. Identify & document User Require'ts. Model Data Entities and Attributes. Integrate into a physical model. Build triggers, indexes, views, forms, & reports. Design, write, & test stored procedures. Write sys., user, & operational manuals using Oracle Designer 2000 v. 1.3, Forms 4.5, Reports 2.5, Oracle v. 7.1, Microsoft Windows 95, NT 3.5.1, VB 4.0, Access 2.0, Microsoft C v. 6.0, HPUX Unix C. Must be willing to relocate within U.S. as project-by-project basis. Must have 2 years college in Engineering, Comp. Sci., Tech. or related and 8 yrs' work exper. in job offered or 8 yrs. in Sys. Programmer, Programmer/Analyst, Programmer, or related. Hrs: 8a-5p, M-F. $58,400 per yr. Apply to Georgia Dept. of Labor, Job Order #GA 6336947, 2943 N. Druid Hills Rd., Atlanta, GA 30329-3809 or the nearest Dept. of Labor Field Service Office.

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"OUR SUCCESS IS YOUR OPPORTUNITY!"

Systems Analyst AS400 Environment

This is an excellent opportunity for individuals with at least three to four years' experience in the AS400 environment with RPGIII experience to join our team. Programmers participate on a project team applying their skills to code, design and maintain interactive and batch systems. Our programmer/system analysts create complex system and database designs and programs and utilize then excellent interpersonal, communication, and presentation skills. If it is a challenge within a team environment that you are looking for, then look no further

MIS Operations Analyst

Individual needed to support Computer Operations functions by analyzing and recommending changes where needed. Assumes responsibility for disaster recovery as it pertains to Operations including vital record storage and recovery. Acts on any system problems. This person will be responsible for the development of Operations standards/procedures/documentation. Should be familiar with all aspects of a computer room environment.

College degree desired or related college level courses. A minimum of four to five years' Computer Operations experience preferred. Knowledge of IBM S/390, AS400 systems, a familiarity with Client/Server technology, understanding of backup and storage technologies including SMS, HSM, DSSMS, RMM, both hardware and software, is required. Highly motivated individual. Organized, analytical and excellent follow through. Strong interpersonal skills. Excellent oral, written communication skills. Must have the initiative required to develop and/or implement new procedures, ideas. Must be able to effectively plan, organize and prioritize work to meet schedules/deadlines without close supervision.

Programmers/Programmer Analysts-Mainframe/Client Server Environment

We need creative, skilled systems professionals to help build the systems that will launch our company into the 21st century. At Commerce Insurance, your skills will be crucial to our growth as we develop our mainframe/client server environment and as we build the systems needed to expand geographically beyond Massachusetts. We have unique opportunities for professional growth utilizing both PC based and mainframe technologies. You will be exposed to client server, PC, and mainframe systems. Operating systems, languages and tools being used include MVS, OS/2, Windows, TSO/ISPF, CICS, COBOL, C, DB2, and Project and Team Workbench.

The ideal candidate will have 3 to 4 years' experience as an IBM mainframe COBOL programmer with working knowledge of DB2. Exposure to CICS, TSO/ISPF, OS/2, MicroFocus COBOL, C, and client server environments are a definite plus.

CHILD CARE

As an example of the commitment to our employees, The Commerce Insurance Company is replacing its existing Child Care facility with a new 20,000 square foot corporate sponsored Child Care Center. It comes complete with indoor and outdoor playgrounds, spacious classrooms, and is located minutes from our office facilities in a suburban, wooded setting.

Join our IS professionals, and explore the exciting opportunities our expanded IS Department can offer, as we head you towards a stable and rewarding future.

If you are interested in seeing what it's like to work for an organization which has the strength of being a leader in its industry, along with the benefits of its local community, please respond today by sending a cover and résumé letter indicating position desired and salary requirements to:

The Commerce Insurance Company,
Attn: Mary-Beth Kaczynski, Dept. CW
211 Main Street,
Webster, MA 01570;
Email:
mkac@compuserve.com
Fax: 508/949-4921.

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Business and Systems Analysts
VB, SQL Server, PB, Oracle, Mainframe

Client/Server Developers
PB, VB, PeopleSoft, Oracle (DBA, Developer, Financials)

Mainframe Programmers
COBOL, CICS, DB/2, SAS, VSAM
IDMS, IMS, RPG AS/400

Application Developers
C, C++, UNIX, Windows NT, Object-Oriented Developers

We offer the opportunity to pursue client satisfaction and participate in building and managing our company. Our competitive compensation package includes excellent salaries and generous benefits, formal/informal training, career ladders, profit-sharing and equity opportunities. For consideration, please forward resume to: **Eastern Regional Recruiting Director, c.w. Costello & Associates, Inc, 321 South Main St., Providence, RI 02903. FAX: (401) 273-3708. Email: llivingstone@cwcostello.com. Website: www.cwcostello.com** EOE.

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SYSTEMS ANALYST. Analyze user requirements, procedures and problems to automate processing or to improve existing computer system. Bachelor of Science degree in computer science, engineering, or math-related, and 2 yrs. experience in job offered required. Must be able to travel. At least two years experience required in design and development of software using C/C++, Visual C++, Visual Basic, Sybase, SQL Server, Autocad, SDRC, Ideas on Windows 95/NT, UNIX platforms. $53,000/yr. Interested applicants apply by resume to: Georgia Department of Labor, Job Order # GA 6234698, 2943 N. Druid Hills Road, N.E., Atlanta, GA 30329, or the nearest Department of Labor Field Service Office.

Career Opportunities with Computer Personnel Unlimited, Inc.: We are seeking bright and industrious staff for numerous positions as Consultants for major clients. Systems Administrators/Developers/Analyst/Programmers (Junior and Senior levels). Requirements: Master's or Bachelor's degree in Computer Science or related field (or equivalent in education and experience), and 1 to 5 years experience in various fields including Oracle 7.X, SQL, PL/SQL, PRO*C, C++, Rogue Wave libraries, UNIX, UNIX Suites, SQL Forms 3.0/4.5, PowerBuilder Report Writer, Developer/Designer 2000, Shell Scripting, COBOL, COBOL II, Visual Foxpro, Sybase, SAP, PeopleSoft, and other Database experience. Salary and benefits commensurate with education and experience. Fax resume with salary requirements to: Computer Personnel Unlimited, Inc., Atlanta, Georgia. FAX No. 770-921-8384 - Attn: S.P. Reddy

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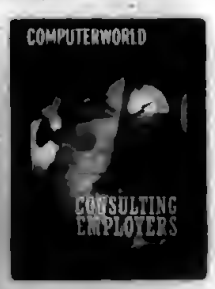

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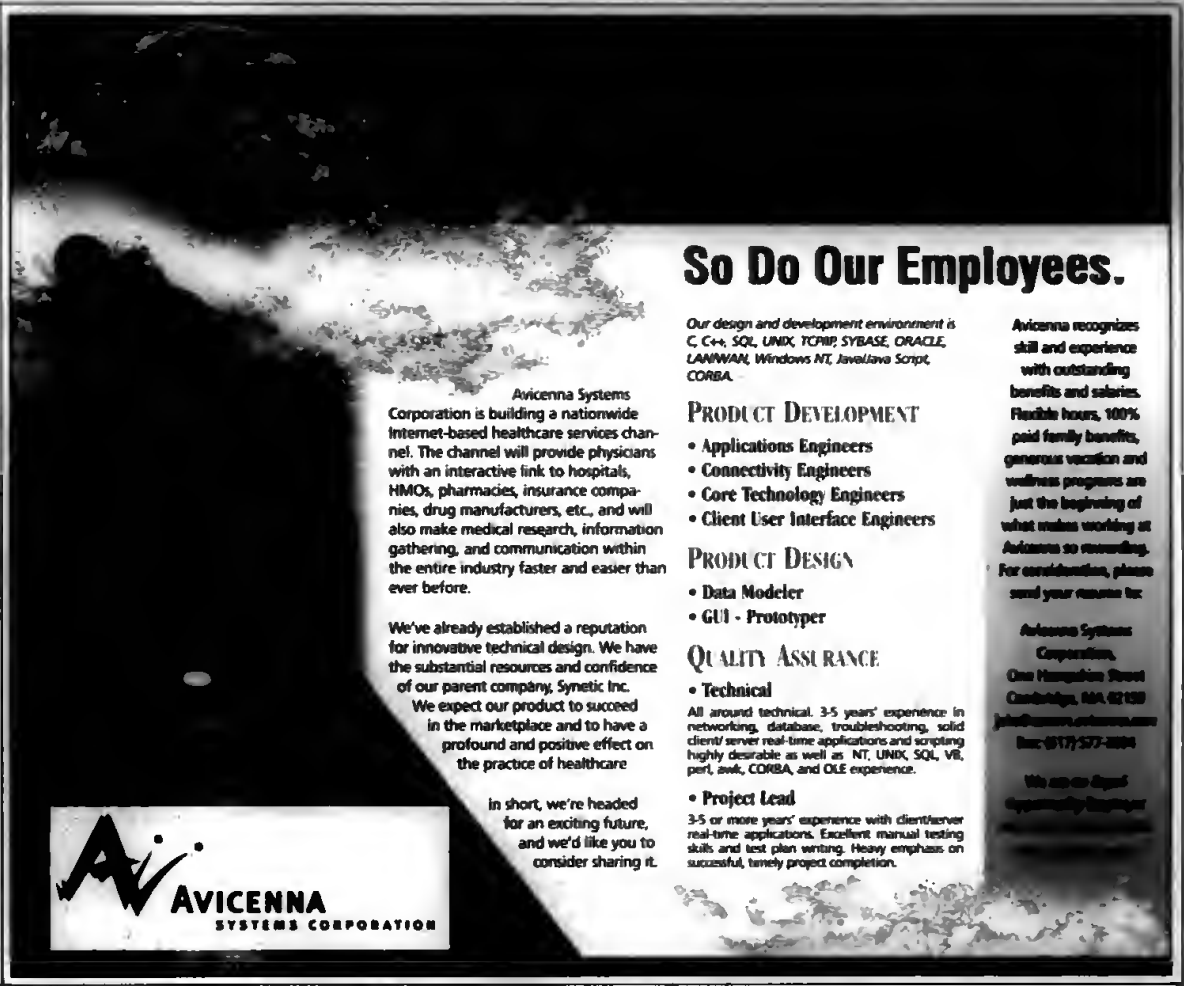
Software Engineer: Design, implement, modify software for clients, inc: Internet applic prog, Web site design, Windows 32-bit prog under NT & W95, user interface design/database access. Enhance, troubleshoot/maintain doc processing system using SGML, FOSIs, Dyna Text Stylesheets. Dev sophisticated CGI apps in C & Perl using Microsoft SQL Server 6.5. Prep tech manuals/reports, train end-users. Provide high-end tech support. Use Windows NT, Windows 95, Microsoft Visual C++ w/ MFC, Win 32, Win32 Multiprocessing/Multithreading, Windows Sockets, Windows ODBC/SQL, Object-Oriented programming/Windows audio, graphics, video programming. Job is in Miami, FL. Req: Master's in Comp Sci + 1 yr exp. $56,910/yr, 40hrs, 8am-6pm, M-F. Submit resume to: FDLES Bureau of Operations, 1320 Executive Center Dr., Suite 110, Tallahassee, FL 32399-0667. Re: JO# - FL1794493.

Systems Design Analyst/Programmer: Manage/dev system to automate complete company operation inc production control, sales, invoicing, acc'ts receivable/payable, purchasing, inventorying design, using know of database design standards, relational databases, business/mgmt apps & scientific apps. Modify existing database programs. Dev/create new database programs. Review project requests describing database user needs. Est time/cost req. Revise company definition of data. Dev data model describing data elements. Design physical database to protect co data resources against unauthorized access. Use Visual Basic, C, C++, PASCAL, COBOL, Natural, TCP/IP, VBX, DLL, SQL, Relational Databases inc DB/2, ACCESS, DOS, Windows. Job is in Hallandale, FL. Req: Bachelors in Comp Sci or closely related field + 2 yrs exp or 2 yrs as Database/Software Consultant. $35,135/yr, 40 hrs, 8am-5pm. Job is in Hallandale, FL. Submit resume to: FDLES Bureau of Operations, P.O. Box 10869, Tallahassee, FL 32302. Re: Job Order # - FL 1776126.



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- Connectivity Engineers
- Core Technology Engineers
- Client User Interface Engineers

Product Design

- Data Modeler
- GUI - Prototyper

Quality Assurance

- **Technical**

All around technical. 3-5 years' experience in networking, database, troubleshooting, solid client/ server real-time applications and scripting highly desirable as well as NT, UNIX, SQL, VB, perl, awk, CORBA, and OLE experience.

- **Project Lead**

3-5 or more years' experience with client/server real-time applications. Excellent manual testing skills and test plan writing. Heavy emphasis on successful, timely project completion.

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Our Information Technology expansion has created a need for a Database Administrator Supervisor. The successful candidate will work with functional department representatives to develop and maintain all aspects of the organization's data structures and repositories. He/She will be responsible for providing logical, physical, technical and organizational leadership for the company's database environment. This includes overseeing the development and organization of the databases, assessment and implementation of new technologies, and providing Information Technology with a long-term perspective on the relationship of databases technology to business opportunities.

The successful candidate will possess: three-plus-years work experience in their chosen field, familiarity with structured design and programming, Oracle training and experience or an equivalent database skill set, client/server and 4GL exposure, AS/400, NT and Microsoft software experience. A BS in Computer Science or Math, MS or MBA preferred. Position is at our Vermont Location. Orvis offers competitive salary and benefits. For confidential consideration please send or e-mail resume to the following:

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SAP

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SAP SECURITY & CONTROLS ADMINISTRATOR

Must have 1+ years' experience in SAP security administration, strong PC and UNIX skills, and DP operations security knowledge or audit background.

ABAP DEVELOPERS

Candidates should have 6 months' experience in SAP Workflow or 1 year of experience in ABAP development plus familiarity with any SAP module.

SAP ALE ANALYSTS & WORKFLOW ANALYSTS

ALE positions require 6 months of experience in ALE or 1 year of ABAP development and general knowledge of any SAP module. Workflow Analysts should have 6+ months' experience in SAP Workflow or 1 year in ABAP development and general knowledge of any SAP module.

AMP

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Software Consultant Responsible for designing, implementing, developing and converting business applications. Conducting studies of client requirements and developing customized business applications. Analyzing, designing, modifying and implementing databases using relational database concepts for applications including financial accounting, manufacturing, sales and marketing, human resources information system and manufacturing logistics. Troubleshooting and providing support for the system and related applications. Implementing and customizing manufacturing package, providing technical support and user training. Utilizing the following to develop business applications and project conversion: VAX/VMS, Windows NT, DOS, UNIX, VAX BASIC, VAX COBOL, VAX C, SQL, DCL, VISUAC BASIC, MF COBOL, VAX/RDB, SQL SERVER, SYBASE, DEC FORMS, DATATRIEVE, CDD, ACMS, DEC DESIGN, DEC RALLY, MICRO FOCUS, BOURCEWRITER AND CO-WRITER. Salary is $63,000/year, M-F, 40 hours per week. Must have a Bachelor's Degree in Computer Science and two years of experience as a Software Consultant or two years of experience in a software application development position. Must have proof of legal authority to work in U.S. Send resume to Georgia Department of Labor, Job Order GA8230827, 2943 N. Druid Hills Road, Atlanta, Georgia 30329 or the nearest Department of Labor Field Service Office.

Senior Software Engineer - Design, develop, and test enhancements for an existing heterogeneous multiprocessor real-time operating system. Duties include design and test specifications, work estimates, and implementation required to extend and support the software. Requirements include a Bachelors Degree in Computer Science, or related field with at least five years experience in the job offered or in the design, development, and maintenance of a commercial multiprocessor real-time operating system in a heterogeneous environment. Thorough knowledge of real-time system control issues, interprocess and interprocessor communication subsystems, synchronization issues, shared memory architecture, and memory mapping issues. Strong background with 68000, Power PC, SPARC processors. Experience need include porting and writing device drivers; and in developing and maintaining board support packages. Applicants must have unrestricted authorization to work in the United States. Salary $65,000-$70,000/year 40 hours/wk. Respond with two copies of resume to Case #71975, P.O. Box 6868, Boston, MA 02114.

SYSTEMS ANALYST. Analyzes user requirements, procedures and problems to automate processing or to improve existing computer system. Bachelor of Science degree in computer science, engineering, or mathematics, and 2 yrs. experience required with Oracle 1000 (S.Q.L. Forms 4.5), Oracle PL/SQL, SQL Report Writer, Erwin Case Tools. Must be able to travel $53,000/yr. Interested applicants apply by resume to: Georgia Department of Labor, Job Order # GA 6234895, 2943 N. Druid Hills Road, N.E., Atlanta, GA 30329, or the nearest Department of Labor Field Service Office.

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SYSTEMS ADMINISTRATORS
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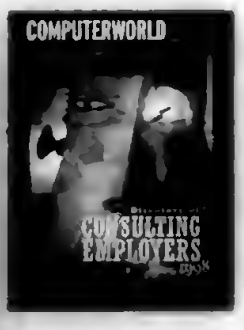

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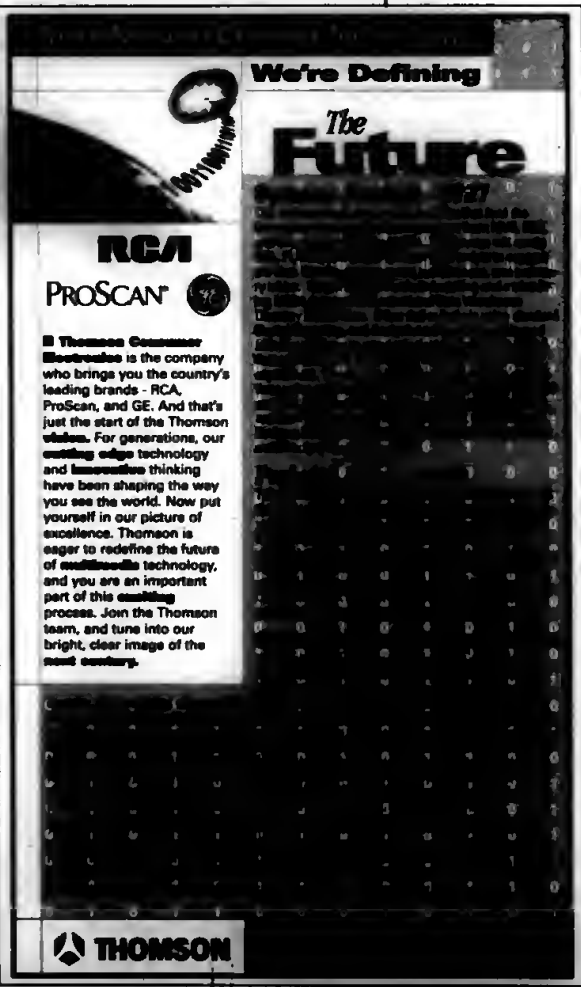

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Wall Street likes SBC deal

The Federal Communications Commission and some members of Congress are worried that too many megamergers between voice and data carriers will undermine competition, but investors seem to like them. "Some businesses should be appropriately huge, and this is among them," says Greg Rossmann, a principal at Broadview LP, an investment bank in Foster City, Calif. Such mergers are attractive because of the cost savings that can result, he says.

Rossmann was referring to SBC Communications, Inc.'s (Nasdaq:SBC) recent announcement that the San Antonio, Texas, company would merge with Chicago-based Ameritech Corp. (Nasdaq:AIT) in a $56 billion deal.

But Rossmann could have been talking about any one of several mergers completed or under way among telecommunications carriers, such as the recent combination of two other Baby Bells — Nynex and Bell Atlantic — to create Bell Atlantic Corp.

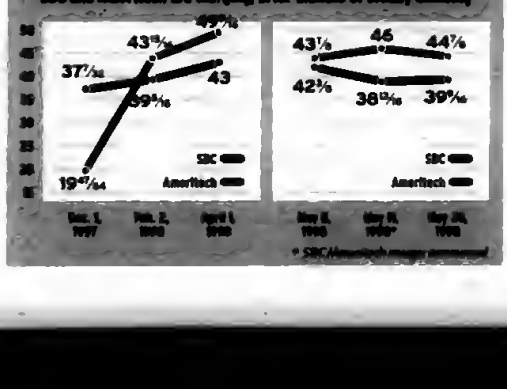
When the SBC/Ameritech merger was announced May 11, Ameritech's stock price hit $46, up from $43.88 three days earlier. SBC saw its stock price drop to $38.81, down from $42.38 three days earlier. But analysts expect the SBC stock price to rise again. The SBC/Ameritech deal renewed the concerns of lawmakers, including Senate Commerce Chairman John McCain (R-Ariz.), that the Telecommunications Deregulation and Reform Act of 1996 is being undermined.

But analysts say there are many more voice and data competitors than even two years ago. Ken McGee, an analyst at Gartner Group, Inc. in Stamford, Conn., says the mergers "are not a story of whether the [telecommunications reform law] works. They are about whether companies can maximize stockholder value by combining with somebody else."

— Matt Hamblen

MERGERS AND CLIMBING TICKETS

SBC and Ameritech are merging, after months of steady climbing



Exch	52-Week High	52-Week Low	Name	Mar 22 1998 2PM	Wk Net Change	Wk Pct Change
COMS	58 00	27.75	3 COM Corp (L)	27.75	-2.38	-7.9
AIT	50.25	30.13	Ameritech Corp	44 69	1.25	2.9
ASND	60 00	25 00	Ascend Communications	45.56	0.81	1.8
T	69 50	34 00	AT & T	50 13	2.00	3.5
BNYN	13.38	1 69	Banyan Systems Inc	6.88	-0.25	-2.9
BAY	41 00	21 00	Bay Networks Inc.	24 94	2.13	7.9
BEL	108 00	67.38	Bell Atlantic Corp	95 19	1 88	2.1
BLS	69.25	42.38	Bellsouth Corp	89 00	3 13	4.7
BRKT	22.75	6.25	Brooktrout Technology	18.44	1.38	7.0
CS	46.50	12.63	Cabletron Systems	13 13	1 63	7.9
CCRN	21 50	8.50	Centigram Communications	12 94	-0.31	3.9
CSCO	81 00	41.69	Cisco Systems Inc. (H)	76.61	0.31	0.4
CMNT	6 13	3.33	Computer Network Tech	4.50	-0.50	10.0
CNCH	30.00	7.00	Comm Intnc Network Corp	22 13	1.25	5.3
DIGI	32.75	16.50	DSC Communications	17 13	-0.31	1.8
FORE	54 50	13.25	FORE Systems Inc	25.00	1.00	4.6
GDC	9 50	3.25	General Datacomm Inds	5.00	-0.50	9.0
GSX	53.00	30.63	General Signal Networks	43 00	0.00	0.0
GTE	58 38	40.50	GTE Corp	54 00	-0.25	-0.4
LU	79 00	31 00	Lucent Tech.	72 19	1 50	2.1
MADGF	9 94	6.25	Madge Networks NV	6.25	-0.50	7.4
MCIC	53 00	27.31	MCI Communications Corp	52.63	2.00	4.1
NETM	3.25	2.00	NetManage Inc.	3.47	-0.25	-6.1
NTRX	3.00	0.63	Netrix Corp	3.13	-0.13	3.8
NCDI	14.38	5.00	Network Computing Devices	6.19	-0.38	-4.4
NWK	22.38	11.63	Network Equipment Tech	16.00	1.69	9.5
NN	93.38	78.94	Newbridge Networks Corp	58.63	1.94	-6.3
NT	59.25	50.69	Northern Telecom Ltd (H)	66.00	2.38	3.2
NOVL	11.88	6.38	Novell Inc (H)	10.31	0.19	1.8
ODSI	16.38	3 38	Optical Data Systems Inc	7.88	0.25	3.3
PCTL	14 13	5.63	Picturetel Corp	9 19	1 13	10.9
PTON	3 00	0.97	Proxon Inc.	1.38	-0.00	-2.4
RACO	4 13	1.00	Racotek Inc.	3.31	-0.06	2.0
RADS	29 38	13.38	Radiant Systems Inc	18.63	-0.50	-2.6
VRTL	1.84	3.94	Retix	4.38	0.69	13.6
SBC	38 56	38 75	SBC Communications	39 38	2.00	5.4
SFA	50 13	14.00	Scientific Atlanta Inc	22.50	-0.44	1.9
SMVA	18.44	6.00	Smna Corp	10.00	-0.38	3.6
FON	75.63	44.00	Sprint Corp	73.38	3.31	4.7
QWST	41 50	19 19	Qwest Communications	36.50	2.94	7.8
SMSC	14.13	8.00	Standard Microsystems Corp	10.63	0.00	0.0
USW	16.00	34 50	U S West Inc	52.00	2.00	4.0
XIRC	18.00	8.63	Xircom	16.00	0.00	0.0
XYLN	31 31	11 38	Xylan Corp	25 13	3 38	10.9
AAPL	31.63	12.75	Apple Computer Inc.	27 75	1.81	8.1
CPQ	39.75	19.13	Compaq Computer Corp	27.56	2.94	8.6
DELL	38.00	24.88	Dell Computer Corp	34 75	5 94	6.5
GTW	58.25	19 38	Gateway 2000 Inc.	49 13	-5.13	10.2
HWP	121.88	80 13	Hewlett Packard Co	50 81	4.31	0.1
MUEI	27.00	6.44	Micron International Inc	11 38	-0.94	7.6
NIPNY	24.00	48.63	NEC America	50.00	-0.25	-0.5
SGI	80 31	30.94	Silicon Graphics	11 63	-0.94	7.5
SUNW	53 31	30 38	Sun Microsystems Inc	40 13	2.81	6.6
DGN	37.94	16.88	Data General Corp	14.25	-0.31	2.4
DEC	62.63	32.88	Digital Equipment Corp	55 13	2.31	4.9
IBM	129 31	61 75	IBM	101 38	-4.00	3.7
MCDD	6.63	3 13	Meridian Data Inc	5.50	0.00	0.0
NCR	38.50	25.63	NCR Corp	30 94	1.00	3.0
PRCM	18.63	8 75	ProCom Technology Inc.	7 50	-0.00	-0.9
SQNT	31.25	15.25	Sequent Computer Sys	17 50	-0.63	3.4
TEXM	6.00	2 50	Texas Micro Inc	4.50	0.19	4.8
SMA	60.75	31.00	Symmetrix Computer Inc	37 94	6.63	12.9
UIS	38.75	6.00	Unisys Corp	25.50	-1.25	-4.8
ADBE	63 13	31 50	Adobe Systems Inc.	43.75	1.75	-1.6
AMSWA	15.63	8.50	American Software Inc	7.69	-0.06	-0.8
APLX	12.50	4.00	Applix Inc.	4.88	0.50	9.6
ARSW	53.25	30.00	Arbor Software	50 16	0.16	0.4
ARDT	18.50	6.63	Ardent Software	13 00	-0.25	1.9
ARSC	36.38	17.75	Ask Corp	30 50	2.25	7.2
ADSK	51 13	30 50	Autodesk Inc.	42.91	1.50	7.7
BMCS	49.31	23.88	BMC Software Inc	44.56	-0.00	-0.0
BOOL	25.81	13 13	Boole Enc Babbage (H)	24 88	0.88	3.8
BORL	12.19	5.88	Borland Int' l Inc.	8.81	0.19	2.2
BOBJY	30 00	6.63	Business Objects	17 94	-0.94	7.0
CAYN	4.25	0.94	Cayenne Software Inc.	2.00	-0.25	-11.1
CNTR	3.21	0.50	Centura Software	2.00	-0.50	-15.6
CHKPF	89.50	21.75	Checkpoint Software	58.23	3.78	11.8
COGNF	35.13	17.63	Cognos Inc.	27.25	-0.13	-0.3
CA	81.00	33 19	Computer Associates	55.19	-2.50	4.3
CPWR	53 38	23 38	Compuware Corp	45.00	2.13	5.0
CSRE	14.00	6.25	Comshare Inc.	7.63	-0.25	-3.2
COSFF	6.00	1.69	Cosel Corp	2.00	0.00	1.3
DWTI	3 38	2.13	Datawatch Technologies Inc	2.50	0.63	75.2
FILE	60 25	13 13	Filenet Corp	56.50	1.00	-2.6
FBYE	18.50	6.94	Forte Software	3 00	0.00	10.1
FTPS	8.50	1.38	FTP Software Inc.	3.38	0.00	0.0
GPSI	19.75	30 00	Group Plans Software, Inc	38.00	2.19	6.1
HUMCF	94.25	24.38	Hummingbird Comm. Ltd	25.75	1.44	-4.6
HPSW	48.63	17 13	Hyperion Software Corp	17.78	-0.34	-0.9
IFMC	80 00	12.50	Information Resources	17 00	-0.31	1.8
IFMX	12.44	4.00	Informix Corp	6.91	1.16	14.3
INGR	14.19	6.69	Intergraph Corp	8.50	0.38	1.9
LEAF	4.00	1.00	Interleaf Inc.	2.00	-0.00	-2.1
ISLI	21.25	8.00	Intersolv Inc.	13.75	1.38	-8.1
INTU	54.94	25.63	Intuit Inc	30 38	-0.38	-0.8
JDEC	42.00	24.88	J.D. Edwards Co	35.75	0.00	0.0
TLC	89.00	6.63	Learning Co (The)	38.63	1.31	4.8
LGWX	16.00	6.88	Logic Works	16.88	-0.25	1.7
MAPS	14.25	8.38	Mapinfo Corp	11.63	-0.25	2.1
MATH	4.63	2.38	MathSoft	3.88	-0.19	-4.6
MENT	13.13	7.38	Mentor Graphics	11.25	-0.38	-3.8
MFGY	48.63	25.00	Micro Focus	32.00	-0.25	7.6
MCSI	14.00	5.50	Microscan Inc	12.25	0.00	0.0
MSFT	98.13	38.75	Microsoft Corp	80.00	8.50	3.9
OBJS	7.25	0.44	ObjectShare Inc.	3.38	-0.06	1.9
ONTL	15.00	8.25	Ontrol, Ltd	8.50	0.44	-4.8
ORCL	42.13	17.75	Oracle Corp	24.13	1.75	-6.6
PMTC	35.25	19.06	Parametric Technology	32.63	-0.31	-0.8
PSFT	57.44	23.38	Peoplesoft	50.00	6.00	12.3
PTEC	18.38	9.88	Phoenix Technologies (L)	10.50	-0.94	-8.1
PSQL	25.00	7.63	Platinum Software	10.13	1.00	7.3
PLAT	51.13	12.00	Platinum Technology	25.94	-0.50	-2.1
PRGS	64.00	15.75	Progress Software Corp	31.25	-0.13	-0.4
RNBO	30.00	18.50	Rainbow Technologies Inc	28.00	0.38	1.6
REDB	11.63	5.00	Red Brick Systems Inc.	5.75	-0.13	-2.1
ROSS	5.40	2.30	Ross Systems, Inc.	3.50	-0.15	-2.7
SCOC	7.25	3 13	SCO Inc.	5.16	-0.81	13.3
SDTI	44 38	20 13	Security Dynamics Tech	22.00	-2.25	9.0
SSW	29.00	19 13	Sterling Software Inc	27 38	-0.38	-2.0
SDRC	30.00	15.25	Struct Dynamics Research	24 38	0.25	1.0
SYBS	23.63	6.00	Sybase Inc.	7 94	-0 31	3.8
SYMC	32.63	17 38	Symantec Corp (H)	30.50	1.88	-6.2
SNPS	67 13	39 13	SynOpsys	43.19	1 81	-4.0
SSAX	11.63	6.31	System Software Assoc	7.88	1.00	14.6
SYSF	14 00	1.63	Systemsoft Corp (L)	2.00	-0.06	15.8
BAANF	55.50	28.31	Tune Baan Co	45.44	6.00	0.0
TRUV	3 19	1.63	Transvision Corp	1.94	-0.13	-6.1
VIAS	89.25	15.00	Viasoft Inc.	16.50	0.00	4.3
VSIO	50.88	25.75	Visio Corp	45.00	1.38	3.2
WALK	30.44	11.00	Walker Interactive Systems	14.00	2.13	12.8
WALL	29.19	11 31	Wall Data Inc	14.00	-0.25	-1.8
WANG	32.25	10.50	Wang Laboratories Inc	25.00	1.19	4.8
AMZN	100.00	15.75	Amazon.com	50.00	5.25	5.8
AOL	90.25	58.63	America Online	94.63	1.75	-2.0
ATYM	47.00	16.69	At Home Corp. (H)	38.13	-0.63	14.8
EDFY	22.13	10.63	Edify Corp	11.63	1.00	13.9
XCIT	90.31	8.00	Excite, Inc.	50.38	9.13	1.9
SEER	45.00	9.38	Infoseek Corp	25.88	4.81	15.7
LCOS	79.13	11.19	Lycos Inc	67.38	-6.00	10.2
NSCP	49.50	14.88	Netscape Comm. Corp	24.94	3.63	12.7
NSOL	30.00	11.75	Network Solution Inc	20.94	2.00	-4.8
OMKT	59.13	8.63	Open Market Inc	15.00	2.13	12.1
PEGS	31.00	12.50	Pegasus Systems	30.13	0.75	1.8
PSIX	16.25	4.25	PSINet	11.25	-0.81	0.7
QDEK	3.00	1.19	Quarterdeck Corp	1.41	-0.19	10.0
SCUR	15.25	9.38	Security Computing Corp	10.63	-0.88	7.6
SPNC	10.50	4.06	Spyglass Inc.	10.38	-0.25	-2.3
YHOO	199.63	80.00	Yahoo! Inc	114.00	-6.94	-4.1
AMD	41.63	17 13	Advanced Micro Devices	30 13	-3.13	13.6
ADI	99.63	59.75	Analog Devices Inc.	80.00	7.00	-22.7
CRUS	11.75	9.38	Cirrus Logic	10.63	-0.38	3.4
CY	16.94	7.00	Cypress Semiconductor Corp	8.38	-0.00	2.6
INTC	102.00	67.38	Intel Corp	74.25	-6.19	7.7
LSCC	74.50	33.75	Lattice Semiconductor	62.38	-2.50	5.7
LSI	48.88	18.63	LSI Logic Corp	21.00	1.38	-6.0
MCRL	46.00	21.50	Micrel Semiconductor Inc	44.00	2.50	0.6
MU	60.50	22.00	Micron Technology	25.25	-2.88	7.3
MOT	80.56	52.00	Motorola Inc.	50.19	-3.94	5.1
NSM	42.00	15.75	National Semiconductor (L)	16.50	-0.44	2.6
RMBS	80.75	25.75	Rambus Inc.	39.38	-4.00	0.7
TXN	71.25	39.69	Texas Instruments	54.44	-4.81	6.1
VLSI	38.69	16.00	VLSI Technology (L)	16.63	0.50	13.1
XLNX	57.63	30.00	Xilinx	41.50	3.22	7.1
ADPT	94.25	15.56	Adaptec Inc (L)	16.94	0.00	0.0
APCC	34.38	16.00	American Power Conversion	30.63	2.00	0.0
AMDA	3.81	0.94	Andataco Inc.	1.91	-0.00	-4.7
CREAF	99.38	14.75	Creative Technology Ltd.	19.94	1.44	7.8
DACE	16.63	6.00	Data Race Inc	1.16	0.13	12.1
DTMI	13.00	1.00	Datatrend Corp (H)	12.50	3.00	-9.6
EMC	67.63	38.00	EMC Corp	50.00	1.00	-2.4
EMLX	21.25	7.38	Emulex Corp (L)	7.50	-0.38	-4.8
ESCC	35.50	34.00	Exabyte and Subsidiary	25.63	-0.94	3.5
EXBT	10.75	5.63	Exabyte	10.75	-0.38	-3.4
INSFD	6.63	2.88	Intelligent Inmp. Systems	2.44	-0.25	-0.5
IOMP	38.75	6.31	Iomega Corp	6.81	-0.00	0.2
KMAG	35.13	11.38	Komag Inc.	19.00	1.00	12.9
MTSI	34.00	13.00	Micro Touch Systems Inc	26.00	-0.50	-3.2
MTIC	17.50	4.25	MTI Technology Corp	13.38	2.19	14.1
AQM	23.00	2.25	QMS Inc	3.94	-0.38	-8.7
QNTM	43.00	17.75	Quantum Corp	30.94	2.00	11.4
RDUS	0.13	1.00	Radius Inc	2.38	-0.13	-8.3
SEG	30.00	10.75	Seagate Technology	22.81	2.75	10.8
SDS	14.25	4.50	Storage Computer Corp (L)	4.50	0.50	11.5
STK	89.75	50.50	Storage Technology (H)	67.63	1.50	4.2
TEK	88.19	30.50	Tektronix Inc.	38.00	2.06	-5.1
WDC	94.75	14.50	Western Digital Corp	17.44	2.38	-11.1
XRX	113.00	65.00	Xerox Corp	100.50	1.63	1.5
AMSY	30.00	17.63	American Mgmt. Systems	19.00	-0.38	-1.3
ANLY	38.50	30.38	Analysts Inc.	38.31	0.81	3.0
AUD	30.69	26.56	Auto Data Processing	64.69	-0.94	1.4
CATP	57.50	28.50	Cambridge Tech Partners	30.75	-0.94	1.1
CFIN	61.38	32.13	Cyrix Corp	39.19	-1.44	-5.8
CDO	45.50	23.38	Compucom Inc.	39.38	-2.19	-5.3
CPU	38.00	30.19	CompUSA Inc (L)	36.13	1.44	-0.3
CHRZ	53.38	25.75	Computer Horizons	32.75	5.00	15.2
CSC	56.75	33.63	Computer Sciences	52.50	-2.25	-0.1
TSK	80.38	28.63	Computer Task Group	30.50	-2.50	-7.5
EGGS	12.75	3.75	Egghead Discount Software	9.00	-0.06	-5.8
EUS	50.00	09.94	Electronic Data Systems	38.31	1.00	2.7
ICO	39.63	22.63	Imation Corp	33.00	3.00	-0.3
REA	50.44	24.00	Reynolds Inc.	30.75	1.25	-2.6
MACA	29.75	10.00	Macanco Inc	12.75	1.75	12.1
PAYX	59.75	32.50	Paychex	52.63	-0.88	-1.0
PMS	61.00	46.50	Policy Management Sys	61.38	1.00	1.3
REY	24.00	13.75	Reynolds and Reynolds	21.00	0.31	1.6
SAPE	17.00	21.38	Sapient Corp	43.50	-0.06	-0.6
SCBI	14.75	6.00	SCB Computer Tech	17 13	0.50	6.3
SEIC	30.00	21.00	SEI Corp	30.50	1.00	1.6
SMKS	82.50	67.38	Shared Medical Systems	71.50	-2.38	0.3
SSPE	24.25	10.00	Software Spectrum Inc.	19.25	0.00	2.7
SDS	89.00	50.75	Sungard Data Systems	34.25	-0.56	1.6
VST	11.25	8.50	Vanstar Corp	14.63	-0.13	0.8

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Trading quips

The air has been so thick with analogies it has felt more like a poetry slam than an antitrust lawsuit. While attempting to spin the issues into everyday terms, one side and then the other has trotted out soft-drink, fast-food, kitchen-appliance and grocery similes in an attempt to sway public opinion.

Pro-Microsoft:
Telling Microsoft to distribute Netscape's browser is like:

- *Telling Coca-Cola it must include three cans of Pepsi in every six-pack.*
  — Microsoft Chairman and CEO Bill Gates

- *The government telling supermarkets which cereals they can put on their shelves.*
  — Rep. Dick Armey (R-Texas)

Suing Microsoft for putting Internet support in its products is like:

- *Penalizing GM for putting air-conditioning in cars.*
  — Former Sen. Malcolm Wallop (R-Wyo.)

Hampering Microsoft via government lawsuits is like:

- *Choking the life out of the golden goose.*
  — Microsoft lobbyist Haley Barbour

Anti-Microsoft:
DOJ supporters say the Microsoft-created Coca-Cola analogy isn't correct. They say it's more like:

- *Coca-Cola owning all the retail stores.*
  — New York State Attorney General Dennis Vacco

Microsoft's control of how the desktop looks is like:

- *Making consumers buy maps where all roads lead to towns with company stores.*
  — Scott Harshbarger, Massachusetts attorney general

Microsoft is like:

- *A company having a monopoly on CD players that makes consumers buy its CDs in order to buy the machine.*
  — U.S. Attorney General Janet Reno

JOEL BOWER ILLUSTRATIONS

A long battle begins

By Kim S. Nash

FILING TWO LAWSUITS that could change the way the PC industry works, the U.S. Department of Justice and 20 states last week accused Microsoft of systematically breaking antitrust laws in an attempt to snuff out rivals.

On Friday, U.S. District Judge Thomas Penfield Jackson set Sept. 8 as the trial date. He also consolidated the two suits.

This is the second round of a protracted struggle between the U.S. and Microsoft Corp., which four years ago settled antitrust charges with an agreement regarding licensing of the vendor's DOS and Windows operating systems. But the July 1994 deal was widely viewed as too little, too late. Alternative providers already had been crushed.

The newly combined lawsuit, which is supposed to save Microsoft's current rivals from a similar death, asks for unbundling features and contractual changes. But a settlement could force Microsoft to rearrange its development and marketing methods.

The lawsuit was hailed by some but called wasteful by others who worried that millions of taxpayer and Microsoft dollars would be spent on a suit that could be dropped as meritless, as was the case with the 13-year IBM antitrust case.

Regardless of the outcome, the suit could take years. State and federal officials, meanwhile, said they will continue to investigate other Microsoft practices and products. For now, the primary charge is that Microsoft used monopoly power in operating systems to illegally muscle competitors, Netscape Communications Corp., in particular, out of contention in Internet software markets.

The best example, the government said, is Microsoft's alleged practice of forcing PC makers to take its Internet Explorer browser when they buy Windows.

Microsoft also tried to collude with Netscape in a meeting two years ago to illegally divide the burgeoning 'net browser market between the two firms,' charged U.S. Attorney General Janet Reno at a press conference.

The Justice Department and states also filed motions for preliminary injunctions that they said will level the playing field while the suit winds through the legal system.

The motions say Microsoft must split Internet Explorer from Windows 98 and sell the products separately. If Microsoft doesn't, it must distribute Netscape's competing Navigator browser with Windows 98.

At his own press conference last week, Microsoft Chairman and CEO Bill Gates denied any wrongdoing. The suits are "a step backward for America, consumers and for the PC industry that is leading our nation's economy to the 21st century," he said.

Joel Klein, lead antitrust lawyer for the U.S., revealed potentially damaging evidence last week, including several pieces of internal Microsoft E-mail. For example, Klein quoted Microsoft marketer Christian Wildfeuer as saying in February 1997, "It seems clear that it will be very hard to increase browser market share on the merits of [Internet Explorer] alone. It will be more important to leverage the [operating system] asset to make people use [Internet Explorer] instead of Navigator."

When asked about the seemingly incriminating E-mail, Gates said, "It's no surprise to me that there [are] quotes from inside Microsoft that say, 'Let's go compete. Let's do a better browser.' "□

Customers endorse Wintel

CONTINUED FROM PAGE 1

ica. By linking the world's most popular PC office environment with the world's most popular computer chips, the two companies have dominated the desktop market by singularly, and sometimes in tandem, setting standards and heavily influencing future product development. They have reaped massive revenues in the process.

Now the two companies may find themselves on the same side of a court docket. Antitrust lawsuits were filed this week against Microsoft, and the Federal Trade Commission continued its investigation into Intel.

If the government can force changes in the way either company does business, ultimately that could mean a change in what sits on users' desktops, what software they use — even how fast they can do their work. And that isn't sitting so well with some users.

They don't want a lot of options.

"I like having a reasonably unified platform," said Kevin Perry, a producer at Red Storm Entertainment, Inc. "In the days before Windows and Intel were as ubiquitous, it was tough figuring out what to use, what would work with everything else. A monopoly isn't advantageous, obviously, but a unified market is."

"We've grown comfortable with the status quo from a user perspective. I use Intel chips. I use Windows. This is my desktop. I like it," said Isaac Applbaum, CEO of Concord, Calif.-based Concorde Solutions, Inc., the IT subsidiary of BankAmerica Corp.

And it is that ubiquitous desktop setup that could be under fire. The chain of antitrust investigations trailing both companies has many industry watchers wondering when the hammer will fall on them as well.

"The Wintel platform is cheap for us to run right now," said Alex Bryer, vice president of distributed computing at Pittsburgh-based Mellon Bank. "No other vendor could jump in and do what they do for us. We're so embedded with them, I can't see [hindering the duopoly] helping."

Howard Arkin, senior vice president and CEO of Gould Paper Co. in New York, said the Wintel platform has been "cheap and easy" for him. "If Wintel is broken up, it has the potential to cost my company a lot of money," he said.

And some analysts said breaking up the duopoly could have far-reaching effects.

"From the 50,000-foot view, for the government to put the brakes on Microsoft and Intel is to put the American technical export marketplace in a sack for the 100-yard dash," said Pete Kastner, chief research officer at Aberdeen Group, Inc. in Boston. "Microsoft and Intel are bringing home billions of dollars in export earnings. Some of the antitrust litigation I've seen in my lifetime has hobbled companies."

But other analysts said that if Wintel was taken down a notch or two, other companies would be quick to step up.

"It's possible that if Wintel wasn't there to innovate, that wouldn't stop Sun from innovating or Hewlett-Packard or IBM or NEC or Hitachi," said Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass. "If one vendor becomes unavailable for some reason, that doesn't stop innovation. It just switches the place where innovation will be happening."□

Senior writer April Jacobs contributed to this story.

ROBERT HOLMGREN

Concorde's Isaac Applbaum: "I would be nervous if things were really to change"

PC makers move ahead with Win 98

By April Jacobs

THE DEPARTMENT of Justice may be demanding changes in Windows 98, but PC makers are moving full speed ahead to ready desktops for a June 25 commercial release.

IBM, Compaq Computer Corp. and Hewlett-Packard Co. said that should a court order block the shipment or seek changes in Windows 98, they would cross that bridge when they get to it.

"We'll need to assess any changes that have to be made and adjust accordingly," said Jim Finlaw, a spokesman for Houston-based Compaq.

Observers said the biggest effect such a court order would have on PC makers is having to unbundle software and replace it, which would take lots of time and money.

But would vendors take advantage of any requirements the Justice Department has asked for and seek to relax their licensing agreements with Microsoft? Sources at IBM and HP said they are reviewing the situation but wouldn't elaborate.

For years, PC makers have complained quietly — and sometimes not so quietly — that Microsoft's rigid and secretive licensing policies can leave users paying for software they don't need or want. Yet few seem inclined to change their bundling practices to include other products. That's because users don't want them to, said sources close to IBM, echoing other PC makers.

But there would be a more immediate impact if Windows 98 is delayed.

Manufacturers and retailers stand to lose money they have already spent on promotions and advertising campaigns.

"The people who sell computers have already geared new technology, product launches and advertising campaigns. Now they're sitting there waiting for Windows 98," said Peter Kastner, chief research officer at Aberdeen Group, Inc. "There are millions, approaching billions, of dollars of trade come June 25 that could be delayed."

A counter argument is that Microsoft and resellers couldn't buy the free publicity the government has created. □

Senior editor Sharon Gaudin and senior writer Kim Girard contributed to this report.

Windows vital, not regulation

CONTINUED FROM PAGE 1

proposing remedies typically reserved for quasipublic entities such as utilities and telephone companies.

Many said Windows is so critical to their companies that they couldn't function without it.

"What would happen if somehow Bill Gates pulled the plug on Windows?" asked Patrick Ryan, a software engineer at Hobart Corp., a scale maker in Troy, Ohio. "What else would we use? We might as well go on vacation. Now that's a wake-up call. We are dependent."

Dave Lingren, director of advanced development at Dun and Bradstreet Corp. in New York, agreed. "If I didn't have Windows for a week, my business would stop for a week."

Some users said they want Microsoft reined in, but even they added that don't want to go so far as having it regulated by a bureaucratic and slow government commission.

Under the law, monopolies, utilities and essential facilities are all different. They are defined as follows:

■A monopoly is a company with the dominant share of a given market. Few people would argue that Microsoft doesn't have a monopoly in PC operating systems.

■A utility has most, if not all, of the business in its market. It is sanctioned to hold that monopoly position by the government and must do business by approved rules. A classic case is a phone company.

■An essential facility is a narrow legal term that refers to a sole and unique product or service through which the owner could control whether other companies could do business. A company that owns power lines for example, has an essential facility for providing electricity.

If a firm owns an essential facility, it must give other companies, even competitors, access to the product or service.

Although the Justice Department said it isn't out to have Windows declared an essential facility, some observers wondered whether a judge might do so anyway.

In a civil lawsuit, a federal judge recently deemed Intel Corp.'s chips an essential facility and ordered Intel to do business with Intergraph Corp.

PAVING THE WAY

If the government "wins on all the issues it did raise, it could clear a path" for other plaintiffs to raise the essential facility claim later, said Ann Yahner, an antitrust lawyer at Cohen, Milstein, Hausfeld & Toll in Washington.

Others disagreed. Though Microsoft may dominate the narrow field of PC operating systems, it is "preposterous" to consider Windows an essential facility because there are alternatives, said Robert Levy, a senior fellow at The Cato Institute, a libertarian think tank in Washington.

Although a court can order Microsoft to do or not do something, the kind of government regulation seen in the electric utility business is far different, Yahner said. It would involve setting up special government commissions to monitor Microsoft and creating a process by which the public could file grievances, for example.

But an argument could be made that Windows is something between an essential facility and a simple monopoly product, said Rich Gray, an antitrust and intellectual property lawyer at Bergeson, Eliopoulos, Grady and Gray LLP.

Microsoft is accused of two main violations of antitrust law. The first is that it abused monopoly power in PC operating systems to help a less popular product, Internet Explorer.

The second, potentially more serious accusation is that Microsoft abused monopoly power to protect that monopoly: That is, bundling Internet Explorer with Windows was intended to crush Netscape Communications Corp.'s browser, which was a threat to Microsoft's operating system.

"The government's approach is very devastating to Microsoft," Gray said. □

FAQ: Time's up; feds sue

A federal court on Friday combined two antitrust suits filed against Microsoft and set a Sept. 8 court date.

Q: *What's the government's beef?*

A: That Microsoft tried to eliminate competition by leveraging its Windows monopoly to force its other software products on consumers and choke Netscape's business after the company declined to enter an alleged conspiracy to divvy up the market.

Q: *What are the key charges?*

A: That Microsoft forced PC makers to take its browser as a condition of licensing Windows and that it prevented PC makers from modifying the boot-up sequence, that it made Internet service providers and others sign "exclusionary" deals that limit or stop them from doing similar business with Microsoft rivals.

Q: *What immediate relief is sought?*

A: That Microsoft either include Netscape's browser in Windows 98 or unbundle its own browser and sell it separately.

Q: *Is the government trying to block shipment of Windows 98?*

A: No, nor did it ask for a delay.

Q: *What's happening with Windows 98 now?*

A: Microsoft shipped Windows 98 to PC makers May 18, the day the charges were filed. And Microsoft says Windows 98 still is expected to be on store shelves June 25.

Q: *Was the states' suit identical?*

A: Not exactly. The states want Microsoft to also ship a third, unnamed browser. They also allege Microsoft leveraged its Windows monopoly to get a leg up in the office suite market. They want Microsoft to unbundle Office and Outlook Express, an E-mail package, from Windows.

Q: *What is Microsoft's response?*

A: There is nothing going on but healthy competition.

Q: *Where can I get more information?*

A: From the National Association of Attorneys General (*www.naag.org*) and the Department of Justice (*www.usdoj.gov*).

— Sharon Gaudin

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Dispatches & Images from the fringes of the digital frontier

STICK IT IN YOUR EAR

Business road warriors can turn their laptop PC into a voice cellular telephone with the Com.plete PC Card from GlobeWave, Inc. in Rochelle Park, N.J. It combines a modem (cellular and landline) with the guts of an actual cellular phone in a single PC card. The gadget has a clever earpiece, called the Jabra, that not only lets the user hear the incoming voice but also has a built-in microphone that picks up the user's voice from inside the ear. The card costs $499.

An overzealous year 2000 fix

U.K. wine broker Bordeaux Index spent a fortune fixing its computers for the year 2000, but now it can't log the recent sale of a Chateau Margaux 1900, reports *The Daily Telegraph* in London. No matter how hard they tried, the computer kept changing the name to Chateau Margaux 2000.

ATM-ON-WHEELS READY TO ROLL

Gooltech, Inc. in Schaumburg, Ill., has developed what it calls the first mobile, wireless automated teller machines (ATM). The cash dispensers are housed in a van that parks at seasonal or temporary locations, such as sporting events, concerts, disaster sites or new shopping malls.

Computerworld INDEX

Java programmers who usually wear jeans when writing code: **76%**

Java programmers who usually wear a tie when writing code: **5%**

Wireless telephone users who don't know their wireless phone number without looking it up: **45%**

Multimedia PC users who have listened to a live radio broadcast on their PC: **25%**

Internet users who actually read spam: **11%**

Internet users who retaliate against spammers with E-mail bombs: **5%**

Most surveyed U.S. market: **Topeka, Kan.**

Companies with dress-down Fridays: **49%**

Sources: Progress Software, Inc., Bedford, Mass.; Strategis Group, Washington; Consumer Electronics Manufacturers Association, Arlington, Va.; "Cyber Insider" newsletter, New York; Survey Sampling, Inc., Fairfield, Conn.; Bureau of National Affairs, Inc., Washington

Inside Lines

Where's the elevator music?

Perhaps there was one welcome outage during last week's outside media. While thousands of users lamented the loss of paper services, folks who dialed in to Consolidated Paper in Wisconsin Rapids, Wis., may have noticed something was missing — no background music! The music feed, zapped as a result of the outage, usually is pure "elevator," as one employee put it. Some callers undoubtedly enjoyed the quiet.

We're not worthy

Oracle CEO Larry Ellison didn't heap much praise on current versions of the company's application software at its user group conference in San Diego last week. Before taking a hands-on role this year, "I didn't know anybody who used Oracle applications," Ellison said. He added that he could get more information about Oracle's business from Yahoo than from the applications. "Application vendors have been living in the Dark Ages," Ellison summed up. Ellison was trying to point out how much better things would be with data analysis features built in to Oracle's new release. But we wonder how the message played with users who paid good money for earlier application versions.

3Com policy talk

3Com [illegible] week will describe its TransceiverWare policy networking solution, which lets IS managers create special instructions that govern how their corporate networks are used. These policies let network managers prioritize who gets how much bandwidth and when. 3Com isn't alone in this area. Ardent Cisco Systems also has been developing a policy-based networking scheme called CiscoAssure Policy Networking.

Le (Last) Weekend

Managers [illegible] as euro conversion projects call it "Le Weekend" — a [illegible] weekend of 1998, when investment banks will be scrambling to get their systems prepped to accept orders starting Jan. 4 in the new euro currency. Members of euro project teams have gloomily accepted that New Year's Eve parties and other holiday festivities will have to wait a year (or longer for those on year 2000 projects). Hans Popperwell, a risk management manager at Interrealto in Switzerland, made a desperate plea at a euro conference in New York last week: "This year, there will be no skiing. Maybe you can come over and help our poor people."

Gateway: A PC strategy

Gateway, the North Sioux City, S.D., PC maker, is calling it the biggest event of the year: a "breakthrough strategy" presentation for the consumer PC market. The event will be held Wednesday at the Equitable Building in New York.

We aren't that kind of tabloid

We have some strange tales at *Computerworld*, but this is one of the better ones. We got a call last week from a guy in California who said he had a bad run-in with a PC maker. He claimed that customer service had treated him poorly and that when a high-up at the vendor found out, she offered him $5,000 to keep quiet about it. But the offer wasn't good enough for our caller. Guess: He called us to see if we'd pay more. We politely declined.

Ever wonder what happened to daredevil Evel Knievel, the motorcyclist who jumped over a string of cars at Caesar's Palace in Las Vegas? Well, he's turned up as an online advice columnist. Knievel debuts this week on the Tripod Sports Zone with his monthly "Ask Evel" column (www.tripod.com/health_ sports/evel). He will discuss everything "from keeping the romance in a relationship and raising a family to dealing with difficult people and asking for a raise." We can't promise you a raise, but if you want to discuss something or share a news tip, contact Patricia Keefe at patricia_keefe@cw.com or (508) 820-8183.

The Back Page

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Dispatches & images from the fringes of the electronic frontier

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3Com this week will describe its TranscendWare policy networking scheme, which lets IS managers create special instructions that govern how their corporate networks are used. These policies let network managers prioritize who gets how much bandwidth and when. 3Com isn't alone in this area. Archrival Cisco Systems also has been developing e policy-based networking scheme called CiscoAssure Policy Networking.

Le (Lost) Weekend

Managers working on euro conversion projects call it "Le Weekend." It's the last weekend of 1998, when investment banks will be scrambling to get their systems prepped to accept orders starting Jan. 4 in the user euro currency. Members of euro project teams have glumly accepted that New Year'a Eve parties and other holiday festivities will have to wait e year (or longer for those on year 2000 projects). Hans Fruyenmuth, a risk management manager at Intersettle in Switzerland, made a desperate plea at a euro conference in New York last week: "This year, there will be no skiing. Maybe you can come over and help our poor people."

Eureka! A PC strategy

Gateway, the North Sioux City, S.D., PC maker, is calling it the biggest event of the year: a "breakthrough strategy" presentation for the consumer PC market. The event will be held Wednesday at the Equitable Building in New York.

We aren't that kind of tabloid

We hear some strange tales at *Computerworld*, but this is one of the better ones. We got a call last week from e guy in California who said he had a bad run-in with e PC maker. He claimed that customer service had treated him poorly and that when e high-up at the vendor found out, she offered him $3,000 to keep quiet about it. But the offer wasn't good enough for our capitalist friend: He called us to see if we'd pay more. We politely declined.

Ever wonder what happened to daredevil Evel Knievel, the motorcyclist who jumped over a string of cars at Caesar's Palace in Las Vegas? Well, he's turned up as an online advice columnist. Knievel debuts this week on the Tripod Sports Zone with his monthly "Ask Evel" column (www.tripod.com/health_sports/evel). He will discuss everything "from keeping the romance in a relationship and raising a family to dealing with difficult people and asking for a raise." We can't promise you a raise, but if you want to discuss something or share a news tip, contact Patricia Keefe at patricia_keefe@cw.com or (508) 820-8183.

IBM

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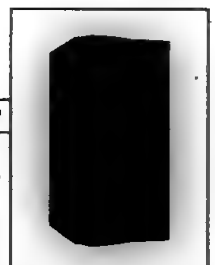
BUT THEN YOU'D HAVE TO BUY A LOT OF SERVERS.



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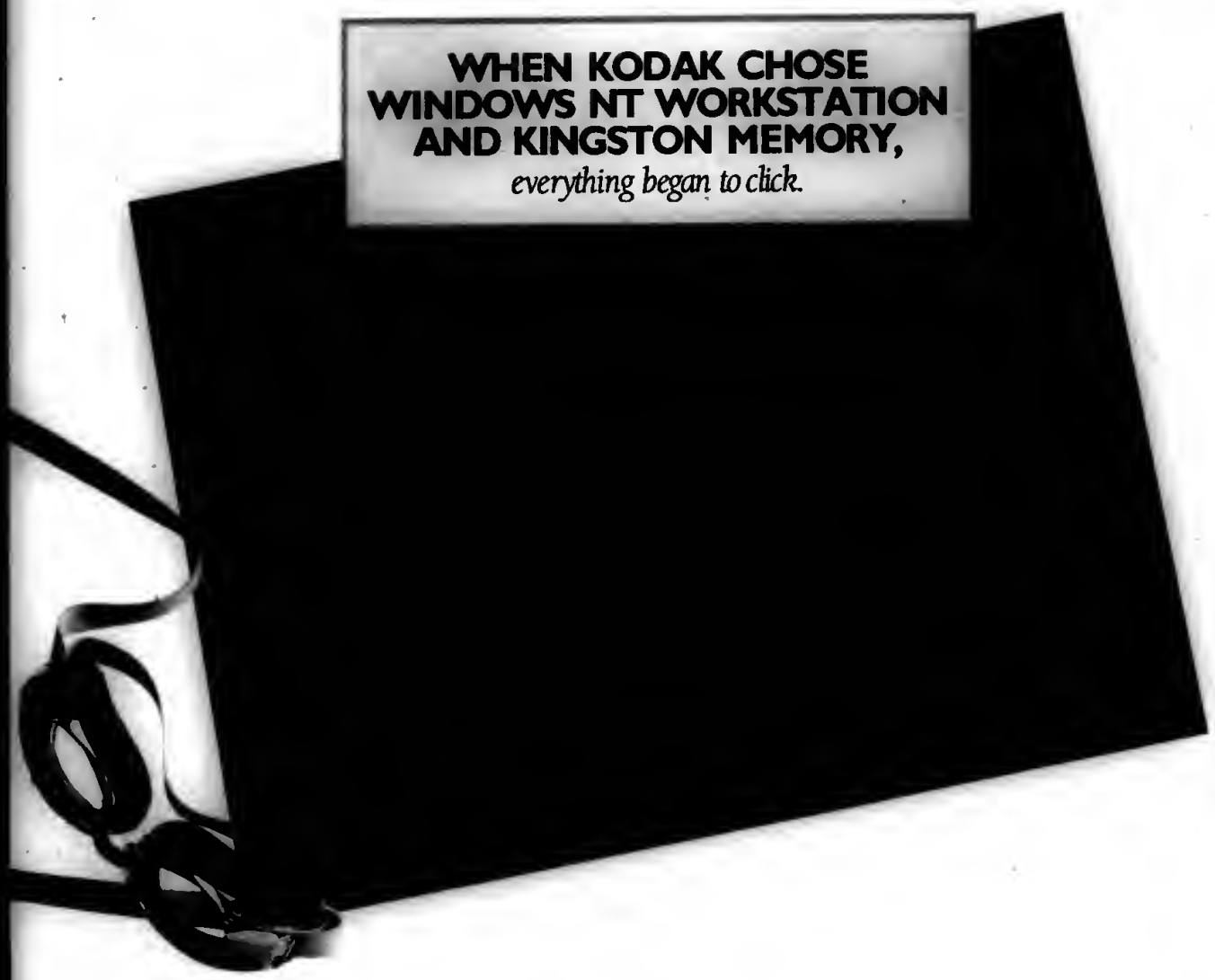
e business tools

WHEN KODAK CHOSE WINDOWS NT WORKSTATION AND KINGSTON MEMORY,

everything began to click.



1 KODAK LOOKED AT ALL THE OPTIONS. But how many operating systems would you trust with 45,000 users? Stability and reliability were Kodak's first priorities. But because their networks are scattered all around the globe, security was a big issue too. In the end, the decision was easy—Microsoft® Windows NT™ Workstation 4.0.

2 NEXT, THEY UPGRADED BOTH NEW AND EXISTING PCS WITH KINGSTON MEMORY. That allowed them to expose all the best features of Windows NT Workstation. Users experienced an increase in performance. And thanks to Kingston's reliability and compatibility, the transition was smooth for network administrators. Putting ample memory on every desktop also helped lay the groundwork for the future.

3 MISSION ACCOMPLISHED. Now Kodak has an industrial-strength, global intranet that links their manufacturing, engineering, research and marketing units. Windows NT Workstation and Kingston® memory are at the heart of it. And yet Kodak is not alone. Why are so many leading companies building cutting edge networks around Windows NT Workstation and 64MB or more of reliable Kingston memory? To find out, call (800) 435-0669 or stop by www.kingston.com/info.

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